Ministry of Forests
and
Ministry of Environment Lands and Parks

RESOURCE MANAGEMENT PLAN

for the

Prince George Forest Region

2001 - 2005

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1 EXECUTIVE SUMMARY

1.1 INTRODUCTION

1.1.1 PURPOSE AND SCOPE

The Prince George Regional Resource Management Plan analyses forest land-based resource issues from the perspective of biological needs and local forest management priorities. This plan is a detailed compendium of resource issues, objectives, strategies and tactical priorities determined by operations staff of the Ministry of Forests and Ministry of Environment, Lands and Parks, in collaboration with their key stakeholder associates, which included major licencees and woodlot licencees throughout the region. The purpose of this planning initiative is to provide forest managers in the resource ministries the information they require to support informed resource management investment decisions.

The RMP is also designed to provide guidance to Forest Renewal BC in determining the most appropriate forest resource investments consistent with their investment policies.

For both purposes, the intended audience for this plan are:

- Ministry and FRBC Executives and Branch Managers;
- Resource Ministry Regional Managers and Directors;
- FRBC Directors;
- Forest District Managers.

This multi-level management audience presents a challenge to determine the appropriate level of technical detail for Districts, Regions, and headquarters. Accordingly, in a concious effort to make this plan a useful document for local resource management planning, it contains the level of technical detail required by District Managers and their program staff. District staff will find information on each of the 10 elements of the RMP localized for their management unit within Sections 2 through11 of the main10 sections of the RMP.

Readers at higher administrative levels, and within Forest Renewal BC, will find the program information they require within Section 1, unless otherwise specified. Supporting detailed informaton can be found elsewhere in the RMP as required.

1.1.2 PLANNING METHODOLGY

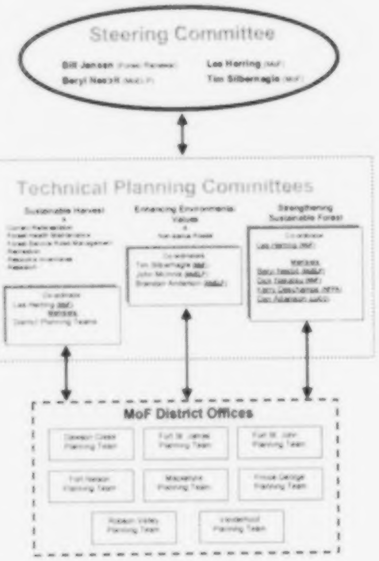
The Prince George Regional Resource Management Plan examines land-based resource needs and priorities, while considering the following factors:

- Commitments, recommendations and links to other land and resource management plans;
- The long term resource implications of current resource management investments;
- The value, risks and benefits of various resource management strategies and tactics;

- Investment delivery recommendations, viable options and consequences of implementing specific strategies or tactics;
- Consistency of planning procedures between forest resource management programs, within and between delivery centres;
- Adherance of investment recommendations to Forest Renewal BC investment principles and ground rules.

The 2001/02 Regional RMP consists of 10 components; three of which directly serve Forest Renewal BC strategic investment planning needs. The 2001/02 RMP was developed to reflect the technical content instructions prepared by the Ministry of Forests Corporate Policy and Planning Branch, and procedural instructions (local Ground Rules) jointly prepared by Forest Renewal, Omineca-Peace Region and the Ministries of Forests and Environment, Lands and Parks (see Appendix 1.1)

A regional planning structure was designed in partnership with Forest Renewal BC, Omineca-Peace Region to ensure that local, consultative stakeholder input was considered in the preparation of the document. Figure 1.1 illustrates the planning structure, and the individuals serving at each level. District planning team representatives are identified in Appendix 2.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Technical Planning Committees
Sustainable Harvest
Enhancing Environmental Values
Strengthening Sustainable Forest
Coordinator
Members
District Planning Teams
MoF District Offices
Dawson Creek Planning Team
Fort St. James Planning Team
Fort St. John Planning Team
Fort Nelson Planning Team
Mackenzie Planning Team
Prince George Planning Team
Robson Valley Planning Team
Vanderhoof Planning Team

Figure 1.1 **Regional RMP Planning Structure**

1.1.3 CONTENT OF THE PLAN

The 2001/02 Regional RMP consists of the 11 component parts. Table 1.1 summarizes the funding relationship between each component.

Sustainable Harvest Component

The Sustainable Harvest component of the Regional RMP identifies resource supply issues within each forest management unit and/or Forest District, and recommends appropriate strategic and tactical silvicultural investments required to to address or resolve them. Enhanced forestry (including stand tending, forest health enhancement, biodiversity maintenance, habitat enhancement and local silvicultural knowledge acquisition objectives) and backlog silviculture (stand tending, site restoration and local silvicultural knowledge acquisition objectives) investments are recommended in this RMP which provide program input to theSustainable Harvest Objective of Forest Renewal BC. Sustainable Harvest Plans were developed within the context of the management unit (TSA, or MoF forest district) by *District Planning Teams* (see Figure 1.1), who assumed the lead planning role for this component. Each District Planning Team submitted a Sustainable Harvest Plan to the Regional Co-ordinator of the *Sustainable Harvest Technical Planning Committee*. The Regional Sustainable Harvest Plan represents the amalgamation of all locally derived issues, strategies and tactics contained in 8 District, and two Woodlot Association submissions. This information will be utilized by Forest Renewal BC for investment planning to achieve their Sustainable Harvest strategic objectives.

Table 1.1 RMP Eligibility list for Forest Renewal BC Funding

Eligible for Forest Renewal BC funding	Eligibility is Project Specific	Ineligible for Forest Renewal BC funding
Sustainable Harvest	Resource Inventories	Current Reforestation
Enhancing Environmental Values	Research	Forest Health Maintenance
Strengthening Sustainable Forest Management		Recreation Sites, Trails and Interp. Sites
		Forest Service Roads and Bridges
		Non-Status Roads

Strengthening Sustainable Forest Management Component

The Strengthening Sustainable Forest Management component of the regional RMP focuses specifically on knowledge acquisition aimed at two aspects of sustainable forest management: maintenance of environmental values and resource benefits. Investments in improved forest management knowledge and decision-making must focus at the strategic, rather than the operational (site or stand) level of resolution. This RMP component identifies and assigns priorities to knowledge required to manage all forest resources. The *Technical Planning Committee* for Strengthening Sustainable Forest Management assumed the lead role in developing this component, while *District Planning Teams* identified local, contextual issues and priorities in management unit specific input. The Regional Technical Planning Committee completed regional issues analysis and developed broad, strategic solutions and investment recommendations. This information will be utilized by Forest Renewal BC for investment planning to achieve their Strengthening Sustainable Forest Management strategic objective.

Enhancing Environmental Values

This RMP component addresses two elements: FRBC priority watershed restoration planning; and other local watershed-related resource issues.

Forest Renewal B.C.'s strategic objective for the watershed restoration element is to restore 20% of the critical watersheds in the Prince George Forest Region by 2005. The RMP indentifies these watersheds and recommends restoration investments required to meet the time-bounded objective. A multi-agency *Technical Planning Committee* assumed the lead role in developing the priority watershed element, with local involvement by *District Planning Teams* where required. The *District Planning Teams* identified locally important stewardship issues and needs which fell outside the strategic and funding criteria of Forest Renewal BC. This information will be utilized by Forest Renewal BC for investment planning to achieve their Enhancing Environmental Values strategic objective.

Current Reforestation

This RMP component falls outside of Forest Renewal BC's funding criteria and is MoF led. The plan identifies activities required to establish free growing stands under the following circumstances:

- Areas deforested by fire or pests from October 1, 1987 to the present day, which have not been salvage harvested and are exempt from the legislative requirements of the Forest Practices Code Act sections 22(5) or 22(6);
- Reforestation of trespass harvesting areas;
- Forest Licence reforestation obligations which have reverted to the Crown since 1988;
- Reforestation on Timber Agreement lands.

District Planning Teams assumed the lead role for developing this component. From each district RMP, recommended reforestation activities and priorities were merged into the regional plan.

Forest Health Maintenance

The Forest Health Maintenance component of the Regional RMP identifies the resource investment requirements necessary to:

- Protect the current timber inventory from destruction by pests and pathogens (bark beetle and defoliator infestations); and
- Provide resource knowledge essential to proper forest pest management activities.

This component lies outside of Forest Renewal BC's funding criteria and is MoF led. *District Planning Teams* assumed the lead role for developing this component, which was incorporated into the Regional RMP.

Recreation

The Recreation component of the Regional RMP identifies investments required to maintain an inventory of recreation features and settings, plan for recreation and incorporate recreation into operational referrals on Crown Forest Lands. This RMP component falls outside of Forest Renewal BC's funding criteria and is led by MoF. The Recreation Section of the Forest Practices Branch assumed the lead role for developing the Recreation Resource Management Plan for the region, which is incorporated into this report.

Forest Service Road Management

The Forest Service Road Management component of the Regional RMP identifies the Forest Service Road maintenance and bridge replacement priorities within each Forest District. This RMP component falls outside of Forest Renewal BC's funding criteria and is led by MoF. *District Planning Teams* assumed the lead role for developing this component.

Non-status Road Deactivation and Rehabilitation

The Non-status Road component of the Regional RMP identifies and prioritizes watershed restoration projects that do not meet the current investment policies of Forest Renewal BC under the Enhanced Environmental Values strategic objective. This RMP component falls outside of Forest Renewal BC's funding criteria and is led by MoF. The *District Planning Teams* have provided the Regional Co-ordinator with the necessary local information to prepare the RMP.

Forest Resources Inventories

The Forest Resources Inventories component of the Regional RMP provides information on the status of management unit resource inventories. The purpose of this information is to identify inadequacies in resource inventory information which is required to address key district business plan issues (business drivers). This RMP component covers areas that are both eligible and ineligible for Forest Renewal funding, depending on specific circumstances. *District Planning Teams* assumed a lead role, together with regional specialists, in developing this component.

Research

This RMP component is intended to identify operational and higher levels of research needed to support resource management decision-making. The responsibility for developing this component is shared at all planning levels, and the Regional Research RMP integrates all research needs from all RMP components.

1.2 OVERVIEW OF REGIONAL RESOURCE MANAGEMENT ISSUES

1.2.1 SUSTAINABLE HARVEST ISSUES

Table 1.2 identifies the key regional Sustainable Harvest issues, and the management units affected. Discussion of each issue, and strategies designed to address them may be found in Section 2 of the RMP.

Table 1.2 Key Regional Sustainable Harvest Issues.

Management Unit	Issue
Prince George TSA	Impending mid-term gap in fibre supply
Prince George TSA	Potential productivity losses in backlog stands
Prince George TSA	Managed Stand Pest Losses
Prince George TSA	Lodgepole pine repression Losses
Prince George TSA	Potential loss of timber quality
Robson Valley TSA	Declining short, medium and long term timber supply
Robson Valley TSA	Pest losses to juvenile white pine
Robson Valley TSA	Potential declining timber quality
Mackenzie TSA	Declining timber supply in the short and medium term
Mackenzie TSA	Potential Loss of productivity on backlog sites
Mackenzie TSA	Declining timber quality

Mackenzie TSA	Potential loss of Caribou habitat
Mackenzie TSA	Potential loss of Grizzly bear habitat
Dawson Creek TSA	Uncertainty in critical resource management assumptions
Dawson Creek TSA	Potential loss of productivity in backlog stands
Dawson Creek TSA	Impending decline in deciduous harvest
Dawson Creek TSA	Potential insecurity of conifer harvest
Fort St. John TSA	Potential decline in the THLB
Fort St. John TSA	Impending fall-down of deciduous harvest
Fort Nelson TSA	Budworm Infestation Losses
Fort Nelson TSA	Potential productivity losses in THLB
Fort Nelson TSA	Potential productivity losses of NCBr.
Fort Nelson TSA	Potential productivity losses in riparian management zones

1.2.2 ENHANCING ENVIRONMENTAL VALUES ISSUES

Table 1.3 identifies the key regional Enhancing Environmental Values issues, and the management units affected. Discussion of each issue and strategies recommended to address them may be found in Section 5 of the RMP.

Table 1.3 Key Regional Enhancing Environmental Value Issues.

Management Unit	**Issue**
All TSA's	Presence of a particular fish species as the key parameter for assigning watershed restoration priority ignores fundamental environmental issues or concerns that might be unique to a particular watershed; the result may limit watershed restoration opportunities within some critically disturbed watersheds
All TSA's	Target/Key watershed management policies eliminate the opportunity to restore fish access or mitigate critical environmental impacts from sediment delivery generated by road and hillslope failures that are a direct result of pre-Code harvest activities.
All TSA's	The criteria for ranking the importance of watersheds provides no priority for water use by single, non-permitted users situated downstream of pre-code impacted headwaters.
All TSA's	Many Category 5 watersheds exist throughout the regiona which must be evaluated to clarify their priority for watershed restoration.
Prince George TSA	Benchmark criteria for determining watershed priority do not favour watersheds within the Vanderhoof Supply Block, thereby eliminating future watershed restoration activities within this district. Subregional considerations of the impact of precluding WRP should be developed to deal with locally important watersheds which do not rank significantly based on key fish species alone.
Prince George TSA	White sturgeon, a critical fish species, is not favoured in the existing Benchmark criteria for assigning watershed priority because the inhabit the mainstems of major rivers.

1.2.3 STRENGTHENING SUSTAINABLE FOREST MANAGEMENT ISSUES

Table 1.4 identifies the key regional Strengthening Sustainable Forest Management issues, the management units (or Forest Districts) affected, and recommended for investments during 2001/02. Discussion of each issue, and recommended investment strategies to address them may be found in Section 8 of the RMP.

Table 1.4 Key Regional Strengthening Sustainable Forest Management Issues.

Management Unit	Issue
All Management Units	Unreliable Forest Resource Inventories
DPG, DVA, DJA, DMK DFN, DDC	Incomplete Caribou Management Objectives
All Management Units	Lack of Species-at-Risk Management Objectives
All Management Units	Lack of General Wildlife Habitat Management Objectives
All Management Units	Unknown Natural Disturbance, Biodiversity and Natural Successional Dynamics Benchmarks
All Management Units	Inadequate Sustainable Forest Management Decision Support Tools
All Management Units	Incomplete Fish and Fish Habitat Management Objectives
DDC, DJO, DFN	Incomplete Understanding of Boreal Mixedwood Stand Dynamics and Management Objectives
DVA	Lack of Specific Pest Management Decision Support Tools
All Management Units	Inadequate or Inaccurate Spatial Resource Base Maps
DRV, DJA	Lack of Alternative Harvesting Experience
All Management Units	Lack of Archaeological Value and Preservation Objectives
All Management Units	Incomplete Visual Sensitivity Objectives
All Management Units	Inadequate Understanding of Managed Stand Site Productivity Potential

1.2.4 CURRENT REFORESTATION ISSUES

The Current Reforestation Program is driven by Government policy regarding reforestation of stands destroyed by fire and pest damage (Section 22(5) *Forest Practices Code Act*). Apart from this corporate direction, there are no prevailing regional priorities which drive the program. All issues and priorities originate within management units (Forest Districts). Except for existing inventories of non-reforested sites, the unpredictive nature of natural events leading to current reforestation obligations prevents accurate projection in a five year business plan.

Current reforestation programs are modest (Prince George, Robson Valley and Mackenzie Forest Districts) to non-existant (Vanderhoof and Fort St. James Forest Districts). The largest inventory, and consequently the greatest investment in current reforestation activities is in the three northern districts. Statistics and projected funding requirements for all Forest Districts may be found in Section 3 of the RMP.

1.2.5 FOREST HEALTH MAINTENANCE ISSUES

The forests in the Prince George Forest Region are experiencing a rapidly expanding mountain pine beetle infestation. At least three factors are known to have contribute to epidemic level outbreaks:

- Extensive tracts of mature lodgepole pine stands throughout SubBoreal TSA's;

- Several years of mild winters;
- The impact on forest structure of thirty years of fire suppression policies, which have exacerbated the natural pattern of susceptable lodgepole pine stands.

While the northern Tweedsmuir Park and Entiako areas are currently the focus of media interests, similar accerating infestation levels are common throughout the Prince George, Robson Valley, Vanderhoof, Fort St. James and Mackenzie Forest Districts.

Vanderhoof Forest District

The latest aerial survey results indicate that MPB spot infestations have increased by 300% in the Vanderhoof Forest District to approximately 30 000 spots. Also, large increases in spruce beetle infestations have been observed to cover two thirds of the drainages in the district. The Ministry of Forests have also made commitments to the Village of Fraser Lake to to treat DFB infestations. Control measures are also focussed in the Finger/Tatuk, Francois Lake Park and Stuart River areas.

Fort St. James Forest District

Aerial survey results indicate a higher proportion of attack within strategic areas than originally expected. Strategic priorities now include control of infestations within 40 km radius of the community of Fort St. James, which affects the Murray Ridge ski hill, the Community Forest, private land and numerous woodlots. Control measures are also focussed on the Nation Lake and Mount Pope areas.

Prince George Forest District

An increase in spot infestations of mountain pine beetle has been observed within the district. Areas around the City of Prince George have been declared critical in a stategic plan. The historical "Alexander Mackenzie Trail" is also a management priority, due to the First Nations significance of the feature. Control measures are also focussed on the Carp Lake and Purden Lake Provincial Parks, West Lake, Dahl Lake and Three Sisters Mountain areas.

Robson Valley Forest District

Recent aerial surveys indicate a 30% increase in small infestations above highways 5 & 16, the viewscapes of which are important to the recreational values of the area. Control measures are also focussed in the Mount Robson Park and Swiftcurrent recreational areas.

Mackenzie Forest District

Forest Health priorities in the Mackenzie Forest District focus on epidemic spruce budworm defoliation problems in the northwest, and MPB detection and control measures throughout the district.

1.2.6 NON-STATUS ROAD DEACTIVATION AND REHABILITATION ISSUES

Annual funding for restoration works in non-priority watersheds was presented as an issue by the EEV RMP steering committee. There are currently licensee, district and even regional scale projects that have been funded by Forest Renewal B.C. over the previous years that identify 'hot-spot' areas to undertake watershed restoration works. These 'hot spots' are comprised mainly of stream crossings (typically culverts) that block fish passage, and road failures or landslide attributable to pre-FPC forest harvesting activity. In previous years, eligible projects have been funded by Forest Renewal B.C. on an annual basis regardless of location.

With the current delivery model of WRP these projects may be funded on a case-by-case basis and if they satisfy the list of requirements as stated under Section B4 of Attachment B of the EEV Guidelines (May, 2000) which includes a provision that they must be within a Targeted watershed. Previous work has shown that up to 80% of culverts on fish bearing streams are barriers to fish passage in the Omineca-Peace and Cariboo Regions, with thousands of kilometers of fish habitat isolated upstream of them. In some districts, re-establishing fish passage is the highest priority restoration work to be completed.

While some of these areas of concern may be addressed through the Non-Status Road Deactivation and Rehabilitation Program, efforts should be made to directly manage these issues. Target/Key watershed management effectively eliminates the possibility of restoring fish access or mitigating environmental impacts from sediment delivery generated by road and hillslope failures that are a direct result of pre-Code harvest activities.

The EEV RMP steering committee strongly recommends that Forest Renewal B.C. develop a strategy to identify and fund issues such as stream crossing and road failure projects in non-critical watersheds on an annual basis. Forest Renewal funds expensive habitat creation and channel stabilization within small scale selected areas, while thousands of kilometers of natural habitat is inaccessible from point source blockages. It is believed that this management effort is the most efficient and cost effective manner of restoring un-used and valuable fish habitat while meeting the restoration targets of FRBC.

1.2.7 FOREST ROAD MANAGEMENT PROGRAM ISSUES

A Roads Management working group evaluated the Forest Service roads maintenance and bridge replacement requirements throughout the region. An estimated 1766 km of Forest Service road which fall directly under the responsibilities of Forest District Managers in the Prince George Forest Region.

Key issues reported in the analysis are:

- The impact of potential budget reductions in 2001/02 will be worsened by higher heavy machinery rental rates expected to offset fuel price increases.
- As sections of road are turned over to the Ministry (as road permits lapse), decisions regarding temporary or permanent closure must be made in order to prudently manage government liabilities. Greater risk to public safety and private property damage are inevitable if road access is maintained in the absence of adequate maintenance.
- Impacts to the Small Business Forest Enterprise Program are expected to increase as roads cannot be maintained awaiting future SBFEP users expected when current market down-turns reverse.
- Delayed or deferred maintenance on roads infrastructure in the present will commit the Ministry into higher future costs associated with right-of-way reconstruction. Biannual brushing and grading costs are approximately $700/km, compared with $5 000 to $10 000/km for reconstruction of ditches and shoulders.
- Road clearing on Forest Service roads providing public access to remote communities and residences will decline with potential budget reductions.
- Some Forest Districts have up to 10 000 km of unclassified roads and trails not included in the present analysis.

1.2.8 FOREST RESOURCES INVENTORIES ISSUES

Forest Health Inventories

Forest Health inventories throughout the region are either unavailable, incomplete, or must be upgraded frequently due the dynamic nature of the pest species being inventories. This is particularly the case concerning the four species of bark beetle, and two year spruce budworm, all of which are at epidemic levels at various locations in the region (see Section 4).

Managed stand forest health inventory status is also inadequate, especially concerning decision support data for managing lodgepole pine stands infected by any of the three species of stem rust. Stem rust hazard maps are feasible, relatively inexpensive inventory products that are needed within all three SubBoreal TSA's in the region.

Hazard maps of several root rot pathogens (*Inonotus tomentosis*, and *Armillaria ostoyae*) species is a potentially important management decision support tool.

Visual Landscape Inventories

The status of visual landscape inventories throughout the Prince George Forest Region is poor. This is a reflection of a lack of or outdated field inventory mapping for a large portion of the visually sensitive/scenic areas identified in all forest districts.

Without accurate and reliable visual landscape inventories, it is difficult to determine societal values and objectives and have proper input into forest development planning. For example, uncertainties related to unrefined and outdated visual landscape inventories make the LRMP recommendations of identifying, managing, and protecting the integrity of important viewscapes for commercial and non-commercial recreation, making scenic areas known, and establishing VQOs difficult.

This knowledge gap not only impacts timber supply and the implementation of the LRMP recommendations, but render operational planning difficult with the risk of creating adverse visual impacts and negatively affecting visual, recreation and tourism values in the short-term.

To address this issue, detailed Visual Landscape Inventories would provide the improved knowledge base necessary to implement the LRMP recommendations and increase certainty about the effects of strategic decisions on timber supply (TSR3). In addition, detailed up-to-date VLIs would better meet Forest Certification principles.

Recreation Inventories

There is considerable risk that non-timber resources will not be adequately managed in several Forest Districts due the inadequate or incomplete state of recreational inventories. Specifically, uncertainties related to outdated Recreation Opportunity Spectrum (ROS) inventories, and Recreation Feature Inventories (RFI), make it, or impossible to implement LRMP and higher level recreation.

This forest level issue involves the balancing of multiple resource objectives. Inventory data, together with user survey data, is the basic information required to ensure the sought for balance.. Once analysed, a management strategy can be designed to conserve and protect key resources, and fulfill recreation management objectives

The ROS and RFI for the Prince George, Dawson Creek, Fort Nelson Forest Districts have not been updated since1994. Using these outdated inventories risks not adequately accounting for features that have been identified recently, or ROS classification criterion which have changed since 1994 (i.e. distance from road, evidence of humans, motorized use, and solitude).

Updating these recreation inventories would ensure that government agencies are able to identify a diverse range of recreation values and uses, and support strategic and tactical planning. Improved recreation resource data is also crucial to the maintenance and enhancement of ecological integrity in areas subject to recreation use. Key knowledge is required to define acceptable levels of appropriate recreation feature use, and identifying and distinguishing commercial and non-commercial recreation use opportunities.

Vegetation Resource Inventories

The vintage of most forest resource inventories in the Region is old (often exceeding 20 years), particularly in the Peace River and Fort Nelson management units. The accuracy and reliability of some of these inventories makes future projections of timber and non-timber values uncertain. Uncertainty in the present and future forest condition makes strategic resource planning difficult. In many cases, improving forest resource information represents the single most effective forest management strategy. Creation of new or improved information on the state of the forest and its stands, sites and waterbodies may offer potential solutions to resource supply constraints, depending on the nature of the forest and supply problems.

Ecosystem Inventories

Biogeoclimatic (BGC) unit mapping has existed for most of the Prince George region for about 15 years. During this time period periodic updates of certain portions of the region have been conducted as time and budget have allowed. Inadequacy of the existing mapping for current planning processes and other operational needs makes a complete update critical.

The original mapping was done by making use of field information and relationships between BGC unit breaks and elevation to draw ink lines on mylars of 1:250 000 NTS maps. This original line work was digitized along with some updates to form the latest digital BCC layer. A hardcopy of the new digital linework was photographically overlain with 1:250 000 NTS maps to form the existing 1:250 000 BGC unit hard copy maps. Due to shifts in scale etc. during the steps outlined above current hard copy maps available are inaccurate.

Current planning exercises including Landscape Unit Planning (LUP) require mapping at a finer scale (i.e., 1:20 000). Some licensees have been updating the BGC layer in conjunction with Terrestrial Ecosystem Mapping (TEM) and Predictive Ecosystem Mapping (PEM) projects. The areas completed either consist of TFL's or landscape units. This piecemeal approach to updating the linework is inefficient and means that not all areas have the same quality of information.

Fish and Fish Habitat Inventories

The inventory census is incomplete for population and habitat information concerning northern fish species and fisheries habitat. Inadequate or unreliable knowledge prevents the definition of clear and measurable objectives, thereby frustrating effective management planning. Without a means of projecting future populations and habitat supply of species such as Bull trout, Arctic Grayling, a conservation management strategy in most forest management units is impossible.

Wildlife and Wildlife Habitat Inventories

The census is similarly incomplete for population and habitat information of wildlife species not currently considered at risk (moose, elk deer, pine marten wolverine and mountain goat). Inadequate or unreliable knowledge prevents the definition of clear and measurable objectives, thereby frustrating effective management planning. Without a means of projecting the future supply of these wildlife species, a management strategy in most forest management units is impossible.

1.2.9 RECREATION SITE AND TRAIL MAINTENANCE ISSUES

To date, revenue from recreation fees and funding from government have not been sufficient to manage regional recreation sites to ministry standards. The lack of funding has prohibited the ministry from maintaining the infrastructure at recreation sites, and there is now a backlog of structure repair and replacement dating back to 1998 when funding was first cut. As an example some sites have deteriorated to the point where essential structures such as entrance signs and toilets are no longer in place. There are 33 sites such sites without entrance signs, and 10 have no toilet facilities. Compounding the problem of deteriorating conditions at recreation sites is a higher public expectation of service and structures at these facilities due to the fact that fees are being charged.

No funding has been dedicated to trails since 1997. The trails and the infrastructure on them are deteriorating and public safety, environmental and liability risks are escalating. The ministry will have to review the option of closing trails do to lack of funding next year.

No resources have been available to carry out recreation resource management activities except at a very cursory level. The total program funding level necessary to meet all priority issues is approximatley $829 600. Currently, the 2000/2001 level of funding to the region for these same activities is $252 500, or 30% of what is considered necessary to adequately meet minimum management objectives.

1.2.10 RESEARCH ISSUES

Section 10 of the RMP describes the process by which Regional Research Issues were developed. There are, however, more critical issues associated with the research program than simply researchable opportunities. The Ministry of Forests Research funding has gradually eroded to a point at or below that required to maintain dedicated research staff. Funding for regional research has, for four years, relied largely on grants administered by the Science Council on behalf of Forest Renewal BC. Even this source of funds is declining, and research investment decisions are shifting slightly away from the scientific-technical research regional clients have come to rely on. Researchers have recently been advised by Forest Renewal to seek out Multi-Year Agreement Holders as a new source of support.

Declining support for new research is only the most visible symptom of serious R&D problems. The impacts of funding and staff cuts on the maintenance and re-measurement of ongoing, long term research investments is not so obvious, but most acutely felt by researchers and research administrators alike. The Prince George Forest Region supports a large proportion of the Ministry's long term research installations. The future of these investments is currently at considerably greater risk than opportunities to initiate new projects.

1.3 REGIONAL SUMMARIES OF THE RMP COMPONENT DATA

1.3.1 SUSTAINABLE HARVEST COMPONENT

The Sustainable Harvest program summaries in the following tables represent the sum of all proposed tactis recommended by operations specialists in each management unit.

Silviculturists throughout the Prince George Forest Region strongly object to the use of the performance indicators incorporated into Table 1.3.1.3. The yield multipliers applied to proposed silvicultural activity levels to estimate potential forest level investment benefits is neither intuitive nor technically valid. This is particulary true of the resultant yield enhancements assumed to result from silvicultural surveys, which has no scientific basis whatsoever, but also applies to the yields assumed attributable to other silvicultural tactics. The silvicultural gains documented in Table 1.3.1.3 are provided only to satisfy information demands of the FRBC portion of the RMP, and are not to be assumed factual, nor useful to the Ministry of Forests. Forest level resource supply effects are not a simple resultant of the sum of all stand level interventions, as explained subsequently.

A resource supply problem occurs when the supply of a specific resource falls short of the level specified in forest level objectives. Supply forecasting provides a means of anticipating supply problems and identifying the need for timely forest management actions. The greatest challenge in forest management is anticipating the need for specific action, at specific times and in specific places. Resource supply is a function of the initial structure and dynamics of the forest, and the spatial and temporal nature of resource allocation to users. Resource supply problems may result from:

biological factors

Site productivity directly affects stand growth rate and productivity potential. Site productivity and the silvics of the timber species in the forest results in specific patterns of stand development. These biological factors in turn influence management factors such as the length of regeneration period, the pattern and level of volume production the time required for development of a specific stand condition, and the long run sustainable yield (LRSY) of the forest estate. The biological pattern of disease and insect damage also affects the short term supply of timber and specific habitat conditions.

forest structure factors

The size of the timber production land base of the forest is a major factor affecting LRSY. Also, the distribution of certain stand age classes may affect both timber harvest flow, as well as the availability of critical habitat or biodiversity features or conditions in the forest. The proportion of NSR in the forest affects the short term timber harvest level, as does the periodic rate of timber losses from fire.

economic factors

The physical geography of the forest estate strongly influences forest management economics. Inaccessible or economically inoperable stands affect the size of the timber harvesting land base, and hence the LRSY. Past or present circumstances which restrict harvesting to a specific portion of the full forest timber profile may result in future reductions in the harvesting land base, and abrupt reductions in LRSY.

integrated resource objectives

> Integrated resource management objectives affect the area of forest removed from the timber harvesting land base. Allocations for special non-timber uses, whether permanent or temporary, may result in periodic or long term interruptions in timber flow.

forest policy constraints

> Forest practices policies, such as harvesting guidelines designed to protect non-timber values, impose constraints which may result in timber supply problems. Examples of these include: opening size and shape restrictions; adjacency and exclusion period (green-up) rules; maximum percentage of area with stands under the exclusion age; minimum percentage of area retained in the larger height classes; old-growth reserves, protection of riparian zones; retention of biodiversity (forest ecosystem networks); snag and green tree retention (within-block diversity); and visual quality objectives. Other policy constraints affecting timber flows are the maximum permissible rate of declining harvest levels in forests with anticipated timber deficits, and the harvest rules regarding minimum rotation age.

Local silvicultural knowledge and expertise is essential to correctly interpret resource supply forecasts and sensitivity analyses, and to estimate the potential benefits from silvicultural interventions. Supply problems may be insensitive to silvicultural interventions because of the current state and projected dynamics of the forest. In this case, forest management objectives may not be addressed despite heavy silvicultural investments, regardless of the agency or organization involved. Effective silvicultural strategy design requires a thorough knowledge of a wide range of management actions and their effects on various resource supply factors.

Silviculturists place great importance on practicing "good" silviculture by carefully selecting and prescribing appropriate interventions based on stand specific considerations. Frequently, however, the connection between stand level silviculture and forest management objectives is not made. The absence of this critical linkage means that stand level interventions are undertaken with little appreciation of their effects on forest resource supply, or worse, mistaken assumptions regarding the benefits accruing as a result of stand interventions.

Stand-by-stand silviculture assumes that a series of individual stand treatments results in an additive impact on resource supply at the forest level. In fact, the effects of stand level actions are usually not additive at the forest level, and a stand-by-stand silvicultural investment philosophy gnores the complex interaction of factors influencing resource supply, and reduces the likelihood of successfully controlling forest dynamics to achieve management objectives.

The contributors to this RMP believe that a forest management strategy should be the guiding reference for stand level silviculture. A comprehensive forest management strategy is necessary before rational choices of stand level interventions and investment levels can be made, and before potential benefits to silvicultural investments are assumed. For this reason, those making use of the summary statistics from this RMP are strongly encouraged to review Section 2 in its entirety. Section 2 contains the results of preliminary strategic analyses and documents the provisional silvicultural strategy for each management unit in the region.

Table 1.3.1.1 **Regional Enhanced Forestry Program Table**

Activities	Treatment Area Goals (ha)					Plan 2001/02	
Stand Tending	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	2620	2968	3152	2709	2262	25.46	66700
Spacing	1483	2173	2016	1150	1150	694.34	979700
Pruning	170	157	235	225	225	1082.35	184000
Fertilizing	950	1000	1433	1913	2400	368.42	350000
Other	3000	3,000	3,000	3,000	3,000	16.67	50,000
Totals hectares	8223	9298	9836	8997	9037	204.35	1,630,400
Planning and prescriptions	3660	3660	3660	3660	3660		3,660
Total dollars							1,634,060
Forest Health Enhancement							
Spacing	0	0	0	0	0		0
Pruning	100	100	100	100	100		120000
Other treatments	0	0	0	0	0		0
Totals hectares	100	100	100	100	100	1,200.00	120,000
Habitat Supply and Biodiversity Enhancement							
Treatments	100	100	100	100	100	500.00	50000
Domestic Range							
Treatments	0	0	0	0	0		0
Enhanced Forestry Activities - Management Unit Total							
Surveys	2620	2968	3152	2709	2262	25.46	66,700
Spacing	1483	2173	2016	1150	1150	694.34	979,700
Pruning	270	257	335	325	325	1,125.93	304,000
Fertilizing	950	1,000	1,433	1,913	2,400	368.42	350,000
Other stand tending activities	3100	3100	3100	3100	3100	32.26	100,000
Totals hectares	8423	6398	6936	6097	6137	219.68	1,800,400
Planning and prescriptions							3,660
Studies funding							159120
Total dollars							1,963,180

Table 1.3.1.2 Regional Backlog Silviculture Program Table

Activities	**Treatment Area Goals (ha)**						**Plan 2001/02**	
Legal Obligations	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006		Unit Cost ($/ha)	Funding ($)
Surveys	5284	4522	5067	4745	4956	0	27.42	144900
Site preparation	869	948	894	250	75	0	719.33	625100
Planting	1529	755	765	799	350	0	582.11	890050
Brushing	1819	2885	3086	2161	1763	0	585.73	1065451
Max. density spacing	490	675	685	675	675	0	232.59	363950
Totals hectares	9991	9785	10497	8630	7819		284.20	3089451
Seedling purchase*	706	250	250	250	250	0	571.39	403400
Total legal obligations								3,492,851
Backlog Reforestation								
Surveys	39907	35753	20874	18877	15059	0	30.05	1199131
Site preparation	2154	1987	2280	2052	1700	0	556.45	1198818
Planting	3741	3676	3537	3076	2455	0	442.82	1656758
Brushing	2355	2233	2294	1118	1096	0	647.54	1525090
Totals hectares	48158	43649	28985	25123	20310		115.86	5,579,797
Seedling purchase*	3347	2678	2544	2481	1865	0	375.86	1,258,000
Prescriptions and planning dollars	0	0	0	0	0	0		313,240
Total backlog reforestation								7,151,037
Impeded areas								
Surveys	56526	45773	33598	29286	28134	0	29.05	1641870
Brushing	14422	14068	13641	9868	8916	0	695.83	10035250
Density spacing	500	320	0	0	121	0	649.99	325000
Totals hectares	71448	60161	47239	39154	37171		167.98	12,002,120
Prescriptions and planning dollars	0	0	0	0	0	0		399,500
Total impeded areas	71448.01	60161	47239	39154	37171	0	173.58	12,401,620
Site Restoration								
Fill planting	30	30	30	30	30	0	400.00	12000
Rehabilitation	260	260	260	260	260	0	400.00	177500
Reforestation	230	260	260	260	260	0	400.00	23000
Totals hectares	520	550	550	550	550		400.00	212,500
Seedling purchase*	230	230	230	230	230	0	400.00	224,000
Prescriptions and planning dollars	0	0	0	0	0	0		17,250
Total site restoration								453,750
Backlog Program Activities - Management Unit Total								
Surveys	101717	86048	59539	52908	48149		29.35	2985901
Site preparation	3283	3195	3434	2562	2035		609.55	2001418
Planting	5530	4721	4592	4165	3095		466.84	2581808
Brushing	18596	19186	19021	13147	11775		678.94	12625791
Density spacing	990	995	685	675	796		443.40	688950
Totals hectares	130117	114145	87271	73457	65850		158.58	20883868
Seedling purchase*	4283	3158	3024	2961	2345		440.20	1885400
Prescriptions and planning								729,990
Recommended studies								0
Total backlog program								23,499,258

* Seed purchase includes seedlings purchase. Units have been standardized as # of ha requiring planting stock; unit cost = $/ha

Table 1.3.1.3 Sustainable Harvest Performance Measures based on Activities Planned for 2001/2002.[1]

	Performance Measure	Tree Improvement	Nursery Seedling Production	Silv. Survey	Site prep.	Backlog Plant	Brush	Space	Prune	Fertilize	Support staff and admin	Totals
	Inputs											
A	**Planned treatment area (ha) in 2001/2002**	6,106	823	52,107	3,283	5,530	18,596	2,473	270	950	93,240	
1.0	**Timber Supply**											
1.1	Potential volume/ha gain (m3/ha/yr)	0.34	0	0.25	0	1.9	0.25	0	0	0.40		
1.2	Years the factor will apply	65	65	65	65	65	65	65	65	65		
1.3	Pot. total merch. volume increment in 65 years (m3)	138,522	0	846,726	0	702,956	319,813	0	0	24,700		**2,032,720**
1.4	Est. yrs reduced to achieve management objectives	5-10	1-3	5-10	0	5-20	5	5-30	0	5-10		
1.4	Est. area that will be reclassified as stocked (ha)			8,994								**8,994**
1.5	Est. area that will be declared as free growing (ha)			35,300								**35,300**
2.0	**Wood Value**											
2.1	Percent improvement in total value at harvest (Compared to no treatment)							5-15%	15-30%	1-5%		
3.0	**Employment**											
3.1	Estimated short term employment (person days/ha)	1	3.4	0.95	9.15	17.9	25.77	36.72	44.32	1.59	1	
3.2	Estimated total employment (person days/year)	611	280	3,843	2,901	10,039	50,214	8,304	1,170	78	9,324	
3.3	Estimated total full time equivalent positions (FTE)	3	1	21	15	56	279	46	8	0	51	**483**
4.1	**Forest Health Enhancement (ha)**											**100**
5.1	**Habitat Supply**											
5.2	Planned area for specific wildlife forage or habitat creation in 2001/2002 (ha)											**100**
5.3	Est. area with secondary value provided to biodiversity (ha)											**500**

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[1] Note: please review the technical qualification this region places on attempting to estimate investment benefits out of context with specific management unit resource supply issues (see next page for details).

1.3.2 CURRENT REFORESTATION COMPONENT

Table 1.3.1.4 Regional Current Reforestation Program Table

		Five-year Plan Goals (ha)						Annual Plan 2001/02		
	Activities	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006		Unit Cost ($)	Funding ($)	Priority[2]
1	Planning/surveys/prescriptions	6565	6579	6339	8704	7624	0	$194	$104,200	
2	Site preparation	492	232	700	418	200	0	2,900	$343,000	
3	Planting	1113	357	761	561	468	0	2,889	$528,200	
4	Brushing	100	350	350	200	200		1,500	$150,000	
5	Max. density spacing	0	0	0	0	500	0	0	$0	
6	Studies	50	0	0	0	0	0	40	$2,000	
7	Other	50	50	50	50	50	0	60	$3,000	
	Totals hectares	8370	7568	8200	9933	9042		135	$1,130,400	
	Seedling purchase	200	180	200	250	250	0	800	$160	
	Total funding								$1,130,560	

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[2] Please consult Section 3 to determine the priority of Current Reforestation tactics within the context of each management unit;

1.3.3 FOREST HEALTH MAINTENANCE COMPONENT

Table 1.3.1.5Regional Forest Health Maintenance – Protection of Current Inventory Sub-program table.

		Five-year Plan Goals						Annual Plan 2001/02		
Activities	**Units**	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006		Unit Cost ($)	Funding ($)	Priority[3]
1 Ground Surveys	ha	90515	90015	90015	90015	90015			10917000	
3 Aerial Survey - overview	ha	9012000	9012000	9012000	9012000	9012000			245800	
4 Aerial Surveys - detailed	ha	2234000	2234000	2234000	2234000	2234000			295800	
Totals hectares		11,336,515	11,336,015	11,336,015	11,336,015	11,336,015			**$11,458,600**	
5 Aerial Survey - overview	hrs flying time	130	140	120	140	120	0	$2,860.00	$101,000	
6 Aerial Surveys - detailed	hrs flying time	80	80	100	80	80	0	$1,100.00	$53,000	
7 Fall and burn treatment	trees	9,600	9,100	9,100	9,100	9,100			$680,200	
8 MSMA treatment	trees	7,150	7,150	7,150	7,150	7,150	0		$295,000	
9 Pheromone baiting	trees	6,050	6,250	6,750	6,250	5,750	0		$210,000	
Trap trees	trees	375	375	375	375	375	0		$22,500	
Total Trees		23,385	23,095	23,595	23,095	22,575			**$1,361,700**	
10 Studies:	number									
Ecosystem planning (DJA)	number	1						$25,000.00	$25,000	
Operations planning (DJA)	number	1						$100,000.00	$100,000	
Archelogical studies (DPG)	number	1						$35,000.00	$35,000	
11 Other										
Forest Fire Plan (DPG)	ha	70						$357.14	$25,000	
Prescribed Burn (DPG)	ha	70						$3,000.00	$210,000	
Heli-logging (DVA)	trees	10,000	12,000	15,000	12,000	10,000		$50.00	$500,000	
Aerial Photos (DJA)	ha	4,000						$17.50	$70,000	
Harvesting (DJA)	ha	30	30	30	30	30		$1,166.67	$35,000	
Well site survey (DDC)	sites	10	10	10	10	10		$800.00	$8,000	
Total Funding Required									**$13,828,300**	

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[3] Please consult Section 4 to determine the priority of Forest Health Maintenance tactics within the context of each management unit;

Table 1.3.1.6 Regional Forest Health Maintenance – Information Sub-program Table.

		Five-year Plan Goals					Annual Plan 2001/02		
Activities	Units	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($)	Funding ($)	Priority[4]
1 Ground Survey	ha	1500	1500	1500	1500	1500	$33.33	$50,000	
2 Aerial - overview survey	ha	3000000	3000000	3000000	3000000	3000000	$0.03	$88,000	
Totals hectares		3001500	3001500	3001500	3001500	3001500			
Studies/ Operational Trials:									
GIS Database (DMK)	Projects	1	1	1				$75,000	
GIS Mapping (DPG)	Projects	1	1	1				$40,000	
Spruce Budworm Study	Projects	4	4	4				$47,800	
Armilaia Study (DRV)	Projects	1	1	1				$22,000	
5 · Treatments	number								
Pheromones	Trees	666	666	666	666	666	30	$20,000	
Fall and burn	Trees	1648	1648	1648	1648	1648	58	$95,600	
Totals (trees only)		2314	2314	2314	2314	2314		$438,400	

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[4] Please consult Section 4 to determine the priority of Forest Health Maintenance tactics within the context of each management unit;

1.3.4 ENHANCING ENVIRONMENTAL VALUES

Table 1.3.4 indicates the recommended investment in Prince George key watersheds for the period 2001 through 2005. Detailed program recommendations may be found in Section 5 of the RMP.

Table 1.2.4 Enhancing Environmental Values Watershed Restoration Program Costs Projected to Meet Forest Renewal Strategy by 2005.

Forest District	Investment Required ($)
Prince George	9 425 000
Robson Valley	1 400 000
Vanderhoof	0
Fort St. James	1 100 000
Mackenzie	3 775 000
Fort St. John	1 615 000
Dawson Creek	4 450 000
Fort Nelson	0
Total Investment 2001-2005	**$21 765 000**

1.3.5 NON-STATUS ROAD REHABILITATION & DEACTIVATION

Figure 1.2 indicates the Regional Non-Status Road Rehabilitation and Deactivation Program requirements for 2001/02 by road priority class. Details are found in Section 6 of the RMP.

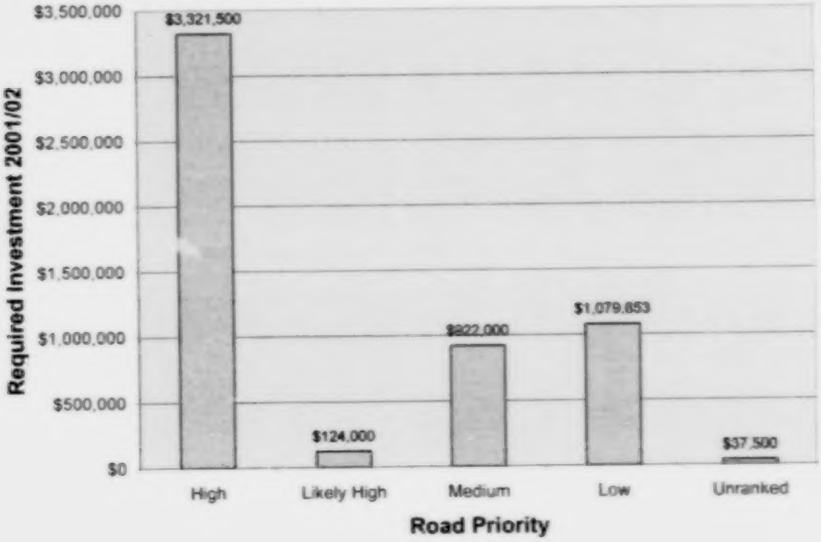

Figure 1.2 **Investments Required in Non-Status Road Rehabilitation Program for 2001/2002, by Road Priority.**

1.3.6 FOREST SERVICE ROAD MANAGEMENT PROGRAM

Table 1.3.1.9 Forest Service Road Management Table.

ACTIVITY	ACCOUNT	PRIORITY	OUTPUT UNITS	OUTPUT GOALS		ESTIMATED COSTS			TOTAL EST. $	BUDGET ALLOC.	ACTUAL COSTS	COMMENTS
					BASE $	CUMUL. BASE $	INCR. $	CUMUL. INCR. $				
Fixed Costs (region $):												
Right-of-way acquisition	*40802*	H	NO			0	0		0			
emergency repairs	*40803*	H	NO.			0	0		0			Held at Region
inspection of bridges/major culverts	*40804*	H	NO.			0	0		0			Handled out of Region
railway crossing maint	*40805*	H	NO.	12	6200	6200	0		6200			
subtotal					6200		0		6200			
Surface Maintenance + Non Modification Repairs (e.g., grading, brushing, cross drain culvert repairs, ditch cleanout, bridge deck cleaning and repair, road surfacing)	*40805*	H	KM	100	300000	306200	0	0	300000			
		M	KM	552	0	306200	350000	350000	350000			
		L	KM	90	0	306200	45000	395000	45000			
subtotal				742	300000		395000		695000			
Modification-Bridge and Major Culvert Replacement (needs road layout and design)	*40806*	H	NO	16	1390000	1696200	0	395000	1390000			
	or	M	NO	5	0	1696200	25000	420000	25000			
	40812	L	NO	4	0	1696200	10000	430000	10000			
subtotal					1390000		35000		1425000			
Modification-Other Works (needs road layout and design)	*40807*	H	NO	4	10000	1706200	0	430000	10000			
		M	NO	2	0	1706200	4000	434000	4000			

(e.g., road relocation, stream culvert replacement, road stability repair)		L	NO.	4	0	1706200	12000	446000	12000			
subtotal					10000		16000		26000			
Road Deactivation	*40808*	H	KM	8	28000	1734200	0	0	28000			
		M	KM	4	0	1734200	14000	14000	14000			
		L	KM	12	0	1734200	42000	56000	42000			
subtotal					28000		56000		84000			
TOTAL					$1,734,200		$502,000		$2,236,200			

1.3.7 STRENGTHENING SUSTAINABLE FOREST MANAGEMENT

A Regional Technical Planning Committee developed a frame of reference for developing Regional recommendations for knowledge investments satisfying the goals of the SSFM RMP. In collaboration with stakeholder planning committees, a total of 116 issues were received, reviewed and ranked according to criteria and weighting defined by the committee.

14 key issues were identified, for which 32 knowledge investment strategies were designed. Among the highest priority strategies were investments in Vegetation Resource Inventories, focussed in the northern three disticts, and population and habitat inventories for Caribou and other species. Table 1.1.4 indicates the projected 5 year investment plan recommended for the Region, by Forest District. Detailed discussions of key issues, strategies and provisions for developing detailed tactical plans may be found in Section 8 of the RMP.

Table 1.1.4 Projected SSFM Investment Recommendations for Prince George Region Management Units.

Forest District	2001/02 ($000)	2002/03 ($000)	2003/04 ($000)	2004/05 ($000)	2005/06 ($000)	Five YearTotal ($000)
Prince George	2 052	2 230	1 655	1 350	1 135	8 497
Robson Valley	2 952	2 895	2 070	1 810	1 095	10 747
Vanderhoof	1 537	1 745	1 490	1 185	900	7 032
Fort St. James	2 552	2 545	2 220	1 810	1 595	10 547
Mackenzie	1 512	2 245	1 990	1 685	900	8 482
Dawson Creek	1 587	1 845	1 590	1 175	865	7 232
Fort St. John	1 337	1 895	1 640	1 185	900	7 132
Fort Nelson	2 137	2 095	1 490	1 185	900	7 882
Total	**15 666**	**17 495**	**14 145**	**11 385**	**8 290**	**67 551**

1.3.8 FOREST RESOURCES INVENTORY

Readers are encouraged to review Section 8 for an estimate of the funding required for a wide range of inventory solutions to SSFM issues; Section 9 for estimates of the funding required to update visual landscape inventories, and recreational opportunities inventories in the region.

1.3.9 RECREATION SITE & TRAIL MAINTENANCE

Readers are encouraged to review Section 10 for a detailed estimate of the recreation management funding requirements of the Region.

1.3.10 RESEARCH

Readers are encouraged to review Section 11 for a background description of all research issues identified during resource management planning.

2 SUSTAINABLE HARVEST

The Prince George Forest Region consists of 6 management units (TSA's) and four TFL's., covering four major biogeoclimatic zones. The guiding silvicultural principles for each unit are, however, common to all, and constitute the regional and provincial position, expressed as follows:

Silvicultural Goals:

- Sustainable Resource Use
- Community Stability
- A Strong Forest Sector

Key Guiding Principles

- Because the distant future cannot be foretold, the best and only course of action in managing the timber resource is that which minimizes risk and maintains options
- Prince George Forests are important locally, provincially, nationally and globally, and should be managed in this context.
- Each generation of northern British Columbian becomes the steward of the region's forest resources and has a moral obligation to preserve this heritage for future generations.

Working Targets

Within the context of the guidling principles:

- Minimize the anticipated interim reduction in timber supply so that management unit harvests may remain as high as possible, consistant with Provincial Timber Supply policy.
- Create a long term timber, steady supply of timber within each management unit.
- Eliminate all pre-1982 good and medium site backlog NSR and all 1982 to 1987 backlog NSR in a reasonable time, specific to the structure of each management unit.
- Over the long term, maintain the production of premium quality logs at a level appropriate to the production potential of each management unit.

Major Silvicultural Strategies

Identify appropriate silvicultural strategies within each management unit, subject to local silvicultural issues and opportunities.

Strategy Implementation

All TSA's within the Prince George Forest Region have a documented, provisional silvicultural strategy.

Apart from these principles and guiding provincial silvicultural policy, there are no over-riding Regional silvicultural issues or priorities. Rather, the sum of all key, management unit (forest district) silvicultural issues and priorities collectively constitutes the issues and priorities of the Region. Each unit reflects a unique forest structure, management infrastructure, development history and community dependence.

Forest level objectives incorporate public forest values, and reflect resource user demands for specific goods, services and forest conditions. The current structure and future dynamics of the whole forest determines the availability and sustainability of forest values, and the degree to which forest level objectives are achievable. Most forest values are related to one or a combination of the following factors:

- a specific stand type,
- a specific pattern of stand types,
- a specific stage of stand development, or
- a specific pattern of stand development stages.

From the perspective of Sustainable Harvest, resource supply is a function of the initial structure and dynamics of the forest, and the spatial and temporal nature of resource allocation to users. Resource supply problems may result from:

biological factors

Site productivity directly affects stand growth rate and productivity potential. Site productivity and the silvics of the timber species in the forest results in specific patterns of stand development. These biological factors in turn influence management factors such as the length of regeneration period, the pattern and level of volume production the time required for development of a specific stand condition, and the long run sustainable yield (LRSY) of the forest estate. The biological pattern of disease and insect damage and also affects the short term supply of timber and specific habitat conditions.

forest structure factors

The size of the timber production land base of the forest is a major factor affecting LRSY. Also, the distribution of certain stand age classes may affect both timber harvest flow, as well as the availability of critical habitat or biodiversity features or conditions in the forest, all of which are cogent to Sustainable Harvest plans The proportion of NSR in the forest affects the short term timber harvest level, as does the periodic rate of timber losses from fire.

economic factors

The physical geography of the forest estate strongly influences forest management economics. Inaccessible or economically inoperable stands affect the size of the timber harvesting land base, and hence the LRSY. Past or present circumstances which have restricted harvesting to a specific portion of the forest, may result in future reductions in the harvesting land base, and abrupt reductions in LRSY.

integrated resource objectives

Integrated resource management objectives affect the area of forest removed from the timber harvesting land base. Allocations for special non-timber uses, whether permanent or temporary, may result in periodic or long term interruptions in timber flow.

forest policy constraints

Forest practices policies impose constraints, such as harvesting guidelines designed to protect non-timber values, which may result in forest resource supply problems. Examples of these include opening size and shape restrictions; adjacency and exclusion period (green-up) rules; maximum percentage of area with stands under the exclusion age; minimum percentage of area retained in the larger height classes; old-growth reserves, protection of riparian zones; retention of biodiversity (forest ecosystem networks); snag and green tree retention (within-block diversity); and visual quality objectives (Nelson 1993). Other policy constraints harvest flows are the maximum permissible rate of declining harvest levels in forests with anticipated timber deficits, and the harvest rules regarding minimum rotation age.

A forest management strategy, not a regional silvicultural strategy, should be the guiding reference for stand level silviculture. The relative "goodness" of a silvicultural intervention is difficult to judge unless viewed within a forest strategy context. Without this contextual linkage, few silvicultural tactics can be objectively evaluated.

Silviculturists in the Prince George Forest Region therefore advocate that a comprehensive forest management strategy is necessary before rational choices of stand level interventions can be made. Without it, one or more of the following risks increases:

- costly silvicultural investments with little or no forest level benefits;
- cumulative forest-level effects which exacerbate a forest management problem;
- large opportunity costs if actual forest management problems are ignored.

Potential silvicultural opportunities identified through forest analysis provide the context for selecting candidate silvicultural practices, and subsequently, possible silvicultural treatments, or treatment regimes (multiple, complimentary treatments). The TSA's within the Prince George Forest Region have completed the first step towards a forest level silvicultural analysis. Two Forest Districts (Robson Valley and Mackenzie) are undergoing the next phase.

Forest analysis requires thorough knowledge of the structure of the forest, its dynamics and production possibilities, as well local experience in observing and estimating the treatment responses and costs of a wide variety of stand level silvicultural interventions.

A biologically feasible silvicultural intervention may have little or no strategic value unless the cumulative effects of implementing it are significant at the forest level. There must be a sufficiently large stand response, an adequate silvicultural treatment capability, and an appropriate number of structurally suitable stands in the forest to produce the forest level effect required.

There is a mistaken assumption by individuals within governments, resource agencies and organizations that forest analysis is a simple and straightforward mathmatical exercise. Forest analysis is not simple; it operates within a complex and uncertain environment. Higher level plans are complete for most of the region, but forest management objectives are rarely stated in clearly defined, measureable terms. This situation reflects the greater difficulties facing forest policy development:

- the objectives of society are ill-defined;
- the values that society attaches to various forest activities such as recreation or preservation of biodiversity are imprecise at best, or simply not known;
- land use and silvicultural decisions often pertain to an uncertain and distant future;
- there is uncertainty about forest tenures, the macro economy, future forest product prices, and the ability of, or need for governments to reduce deficits/debts.

Compounding the difficulties imposed by societal uncertainty, the effects of silviculture and forest management decisions are often far from certain, both from a biological and socio-economic perspective. The biological realism and subsequent precision of forest analysis depends greatly on the analyst's and user's silvicultural knowledge and experience in the forest under analysis, and the accuracy with which stand responses can be predicted.

In the face of many sources of uncertainty, including measurement error, lack of judgement, imprecision, unreliability, variability, vagueness, ignorance and ambiguity, there is a tendency for silviculturists to reject forest analysis as a practical tool. By comparison, stand-by-stand decision-making offers the appearance of a less complex, more pragmatic and perhaps more satisfying approach to silvicultural investment. "Site-specific" silvicultural treatment prescriptions are often assumed to reflect "good forestry" in the mistaken assumption that stand level effects are additive at the forest level. They usually are not.

In spite of the fact that little can be done to improve forecasts of future markets, human values or social needs, thoughtful and biologically realistic forest analysis provides a means of dealing with management uncertainty. A greater appreciation and understanding of forest dynamics will enable forest managers and public forest users to see the probable future outcomes of forest management options, thereby allowing present day choices to be made, and permitting timely planning and implementation of silvicultural investments and interventions

The remainder of this Sustainable Harvest RMP consists of the following major Sections:

Sections 2.1 to 2.6	Sustainable Harvest issues and provisional silvicultural strategies and tactics, by management unit.
Section 2.7	A summary of the silvicultural priorities for each management unit.
Section 2.8	A summary of the Sustainable Harvest data making up the Forest Renewal Sustainable Harvest RMP for the Prince George Region.
Appendix 2	Management Unit RMP contacts and support personnel.

2.1 PRINCE GEORGE TSA SUSTAINABLE HARVEST ISSUES AND SILVICULTURAL STRATEGY

This section describes the key sustainable harvest issues in the Prince George TSA, and defines a provisional silvicultural strategy to address them. The following strategic analysis is based on a recently completed Type I Silvicultural Analysis, but requires further, detailed forest analysis and modelling to validate and refine underlying assumptions. In the meantime, this strategy is reflected in the proposed, 5 year Sustainable Harvest Plans for each of the three forest districts making up the TSA. (Section 2.8).

2.1.1 THE RESOURCE LAND BASE

The Prince George TSA covers 7 512 789 hectares, of which 3 450 712 (46%) is considered to be in the timber harvesting land base, and is administered by the Prince George (1 429 558 hectares), Vanderhoof (777 028 hectares), and Fort St. James (1 244 126 hectares) Forest Districts.

Figure 2.1.1 shows age class distribution by leading species for the timber harvesting land base. The timber harvesting land base is comprised of 1.4% fir stands (51 730 hectares), 16.1% balsam stands (583 862 hectares), 33.0% spruce stands (1 193 796 hectares) and 49.4% pine stands (1789 350 hectares).

Approximately one-half of the timber harvesting land base consists of pine stands 121 years or older; and spruce, balsam and fir stands aged 141 years or older. As a consequence of species silvics and seral succession, stands older than 160 years tend to be dominated by spruce and balsam.

Spruce and pine dominates stands between the ages of 0 and 40 years, originating mainly from reforestation activities since 1970. A large proportion of the TSA is consists of pine dominated stands aged 40 to 160 years, most originating from large wildfires. These stands are expected to support future harvesting in the medium-term, as long as the scheduling of existing mature stands is planned to support harvesting until these younger stands reach operability.

Lodgepole pine dominates stands aged 41 to 160, with a smaller proportion of spruce. A majority of the stands older than 160 years are made up of spruce and subalpine fir.

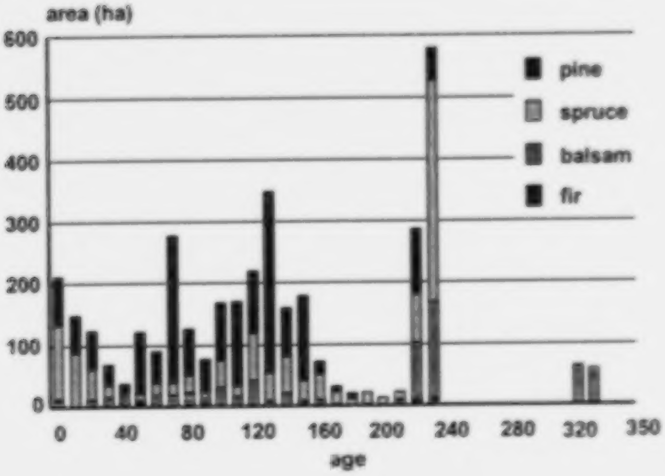

Figure 2.1.1 Area by stand age and dominant tree species—timber harvesting land base, Prince George TSA 1995.

Figure 2.1.2 illustrates the composition of the timber harvesting land base by supply block, tree species and site productivity. Pine stands occupying medium site classes make up the largest component of the TSA (26%). The Vanderhoof District contains the majority of the TSA's medium and poor pine stands (52.6%). The Prince George and Fort St. James Forest Districts contain virtually all of the good site pine stands (88.5%).

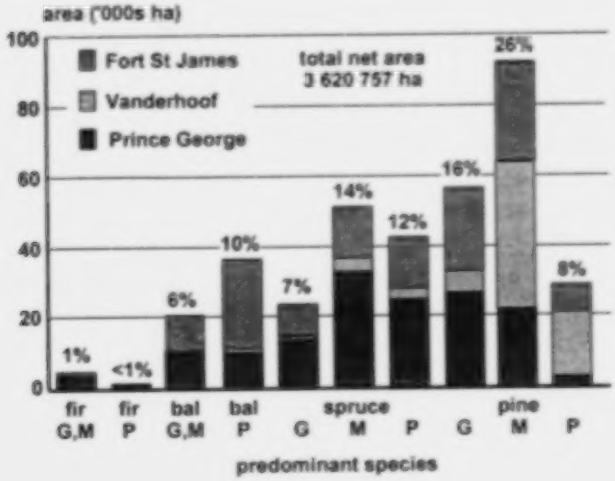

Figure 2.1.2 Area by dominant tree species, site productivity and forest district– timber harvesting land base, Prince George TSA 1995.

2.1.2 RESOURCE SUPPLY ISSUES

2.1.2.1 TIMBER SUPPLY – VOLUME

Limited Potential for AAC Increase - Currently there is no mid-term fiber supply shortfall forecast for the Prince George TSA. There are localized shortfalls, however, which have recently forced large-scale spatial shifts in industrial operations. There are also some indications that mid-term conditions for the TSA as a whole will limit early capture of the potential long term benefits that are yet to be calculated based on OGSI adjustments and genetic gain. Silvicultural strategies to address this issue must either move stands up in the harvest queue or increase volumes in stands that are likely to be harvested in the mid-term period. Either strategy will increase harvest flexibility in the mid-term by increasing the volume of timber that is available for harvest.

Lodgepole Pine Height Growth Repression - Density related repression of lodgepole pine is known to be commonplace in the Prince George TSA, and reduces pine volume production by slowing stand development. Currently it is difficult to determine the degree of repression inherent in the existing forest cover. Stands with light and moderate levels of repression are still included in the THLB, but projected volume production is well below site potential (a reduction in apparent SI50 from 20 to 15 will result in roughly a 50% loss in MAI). Stands with high levels of repression may be excluded from the THLB due to a low apparent site index, even though potential SI50 may be 18 or more.

Backlog Status - The future supply of timber may be impacted where the TSR assumptions regarding backlog stocking status may be out of step with actual stand conditions. Treatment of backlog stands is viewed as a mandatory program, and assumptions for completion have already been included in TSR. For the most part there will be no timber supply gains per se; the benefits will be in maintaining the conditions that are already assumed. To a small degree, however, there may be some timber supply benefits in accelerating the backlog program over the TSR assumptions; earlier treatment will result in earlier availability for harvest. There may also be small gains through improvement of stocking conditions beyond those assumed.

Stocking Standards and Yield - Existing stocking targets for both current and backlog reforestation may impact timber supply. Recently increased stocking levels may increase harvest volumes and decrease culmination ages. For example, theoretical analyses suggest that increasing free growing stocking targets from 1200 to 1800 trees/ha for a lodgepole pine stand of SI50=20, would result in an 0.4 m^3/ha/yr (8%) increase in CMAI, and a decrease of 8 years in MAI culmination. Theoretical benefits would include increased harvest flexibility and a higher LTHL.

Vegetation Management Requirements - The TSR assumes that existing regenerated stands are unimpeded, an assumption which may be optimistic. This issue must be addressed via an aggressive brushing and spacing program.

Forest Pest Losses - Forest health issues affect either the volume of existing mature stands in the TSA (Mountain Pine beetle, Douglas fir bark beetle, spruce beetle, Balsam bark beetle, spruce budworm), or the volume production of regenerated stands (Spruce (White Pine) Leader Weevil, Lodgepole Pine gall rust, Commandra blister rust. An epidemic level of bark beetle infestation is prevalent in the Fort St. James and Vanderhoof supply blocks largely due to the age class distribution of the forest. For example, approximately 70% of the Fort St. James Forest District (2.7 million hectares) is comprised of mature and over-mature timber, highly susceptible to pest damage. While the extent of infestation is not known with any precision, a conservative estimate for Fort St. James is close to 1 million ha.

The impact of the forest health issue on harvest activity is reflected in the Vanderhoof Supply Block. It is estimated that up to 80-90% of the 2001annual harvest will come from salvage cutting of Mountain pine beetle and spruce beetle infestation areas. This represents a doubling of salvage harvest since 1999.

2.1.2.2 TIMBER SUPPLY - QUALITY

The premium timber product throughout much of the TSA remains as sawlog quality spruce and pine with diameters greater than 40 cm and heights between 22 and 35 metres. Log quality and size will continue to decline as younger stands are selected for harvesting, yet tactical options to improve timber quality in the Prince George TSA are limited to stand density management manipulation (plantation stocking density and precommercial thinning) and tree branch pruning.

For example, current sawmill configuration in the Vanderhoof Supply Block require sawlogs with a mean diameter at breast height (DBH) of 22 cm, and average relative density at breast height of 0.41 g/cm. Cost effective harvesting requires operable stand volumes of approximately 300 m^3. These timber product specifications can be achievied in second growth stands by maintaining stands at sufficient densities to satisfy the operability requirements, as well as encouraging natural, early crown lift, thereby minimizing the amount and proportion of juvenile wood production, and maintaining optimum tree and log characteristics.

While stem pruning offers a second option, it is practical only as a specialty timber production tactic. Pruning investments remain questionable for the TSA due to uncertain future timber markets and consequent poor stand level investment return. Pruning may be considered as a strategic investment at such time when these uncertainties have been resolved.

Tree branch pruning may be a more viable tactic for minimizing the stand production losses associated with lodgepole pine stem rust infections. As a forest health activity, the pruning-removal of lethal branch infections could have a beneficial impact on stand production. Treatment may prevent rust infected areas classified as SR from becoming classified as NSR. This may be a more cost effective alternative to stand rehabilitation and re-establishment.

2.1.2.3 HABITAT SUPPLY

Prince George Supply Block Issues

- ungulate winter range – upland sites
- overall forage supply – upland sites
- riparian cover and protection - streams and wetlands
- homogeneous stand structure

Fort St. James Supply Block Issues

- stand dynamics and the future supply of specific habitat types (lichen production,
- impact of fire control on the supply of specific habitat, such as grasslands

Vanderhoof Supply Block Issues

- Managed stand structure and habitat quality/use by large mammals (deer, moose and bear).

2.1.2.4 EMPLOYMENT ISSUES

In the Prince George Supply Block, a large portion of the stand tending program is implemented using labour intensive. manual methods. A shift to a higher proportion of herbicide treatments is necessary to ensure better efficacy of treatment, and to allow for higher timber supply gains with a fixed or reduced budget.

In the Fort St. James Supply Block job outcomes are dependent on licensee activities. The district should maintain ample opportunities for local contractors through the competitive bid process. In addition, licensees have either First Nation partners or hire contractors who employ aboriginal people.

Much of the planned work is seasonal, but pre-commercial thinning can be done during winter months. This extends the traditional work window right through to spring if there is not an unusually heavy snowfall, giving some stability to that group of workers.

2.1.3 SILVICULTURAL PRACTICES

2.1.3.1 INCREMENTAL SILVICULTURE HISTORY

Table 2.1.1 documents the incremental silviculture activities for the Prince George Supply Block since 1990. Tables 2.1.2 and 3, document precommercial thinning, fertilization and pruning activities for the Fort St. James Supply Block since 1980. Table 2.1.4 documents the incremental silviculture activities of the Vanderhoof Supply Block since 1995.

Table 2.1.1 Incremental Silviculture history 1990-99 , Prince George supply block.

Year	Silviculturally Treated Area (ha)							
	Surveys	Brushing	Site Preparation	Planting	Juvenile Spacing	Fertilization	Pruning (first lift)	Audit
1990	51332		6331	15940	439			
1991	54425	6349	5456	10258	847		21	
1992	52858	8104	4211	6293	860		6	16
1993	41827	6343	2422	5429	1275	4	20	
1994	50773	5542	1016	3057	896		104	6
1995	48189	4168	779	3472	1462	0.3	2	
1996	30282	4162	44	1587	1009		154	
1997	45555	2046	575	1187	2123	286		
1998	32036	2511	445	367	2467		84	
1999	5547	29	7	224	142			
Total	**412823**	**39254**	**21286**	**47813**	**11520**	**291**	**391**	**22**

Table 2.1.2 Incremental silviculture history 1980-89 , Fort St. James Forest District.

	Silviculturally Treated Area (ha)	
Year	Fertilization	Juvenile spacing
1980		19
1981		60
1982		39
1986		122
1987		467
1988	325	273
1989	272	430
Total	**597**	**1410**

Table 2.1.3 Incremental silviculture history 1990-98 , Fort St. James Supply Block

Year	Silviculturally Treated Area (ha)		
	Fertilization	Juvenile spacing	Pruning Single Lift
1990		634	
1991		1338	186
1992	713	1343	16
1993		1284	317
1994	528	1052	174
1995		454	124
1996		819	272
1997		850	97
1998	125	445	116
Total	**1366**	**8218**	**1302**

Table 2.1.4 Incremental silviculture history 1995-2000 – Vanderhoof Supply Block

	Silviculturally Treated Area (ha)			
Year	Juvenile Spacing	Fertilization	Pruning	Surveys
1995	1359.2	0.0	59.2	962.3
1996	1818.9	571.4	652.3	9079.3
1997	2243.6	823.7	69.8	4649.5
1998	2478.0	13.6	445.0	5679.7
1999	2029.3	342.6	330.2	3167.9
2000	967.9	0.0	0.0	1612.7

2.1.3.2 BACKLOG SILVICULTURE

Conventional restocking (site preparation, planting/fill planting) and crop enhancements (brushing and weeding/conifer release) are employed in the TSA to address backlog NSR and impeded stands.

Prince George Supply Block

The Prince George Forest District has approximately 18 000 hectares of Backlog NSR. Of this area, approximately 75% may be reclassifiable to a stocked condition. These stands are generally old "intermediate utilization" blocks so the residual timber volumes they support are undoubtably marginal. Treatable NSR sites are a high priority as well as stand improvement treatments of backlog plantations, both of which require extensive silvicultural surveys and prescription preparation.

Current information indicates there is approximately 18,000 hectares of backlog NSR within the District. Approximately 350,000 hectares of pre-1987 harvested area has been reforested in this supply block.

Fort St. James Supply Block

There are approximately 2 500 of backlog NSR in the supply block, including 500 ha within the Pierre Forest. Silvicultural surveys are required to develop prescriptions for treatments needed to reach free growing or reclassify sites as non-productive. The aim is to eliminate NSR areas by 2005/2006. All treated stands are expected to reach a free growing state by the year 2020. There is an increasing trend to manually treat impeded stands rather than rely on herbicides in this supply block due to on-going protests over the use of forest herbicides by First Nations groups.

The status of the Pierre Forest portion of backlog NSR is unique to this supply block. The Pierre Forest was originally logged in the late1950's to early 1960's. It was part of Tree Farm Licence (TFL) 42, which was awarded in the early 1980's. As part of the agreement, reforestation for this tree farm licence remained as Ministry of Forest responsibility. In the late 1980's to early 1990's rehabilitation and planting was carried out by the Forest Service, and the need for followup brushing treatments was anticipated since these sites were considered difficult to reforest. First Nations managers of the TFL were fundamentally opposed to the use of herbicides, yet manual brushing treatments were not considered an cost effective nor reasonable alternative by the Forest Service. Despite these circumstances, it was decided at that time (early 1990's) that the TFL Licencee's management plan obligations would be limited to manual treatment of the area.

Surveys from 1999 on the entire Pierre Forest indicate that 47%of the area is now NSR; 46% is SR and in need of brushing; 1% is FG; and 6% is in permanent access or non-productive state. In view of the state of reforestation, and the inability of the licensee to implement remedial measures, senior Forest Service managers have allowed the licensee to include portions of the Pierre Forest in the area eligible for Forest Renewal British Columbia (FRBC) treatments as pre 1987 backlog. Each site must be approved, by the Ministry of Forests, based on good forest stewardship and the cost effectiveness of the treatment.

Vanderhoof Supply Block

Surveys, prescription development and brushing are the highest priority backlog silviculture tactics in the supply block. All backlog impeded stands are expected to reach free growing status by 2010. The anticipated scale surveys will decline after 2001, and the scale of brushing required to meet the free growing objective will be relatively small compared to the other supply blocks.

Reforestation is a moderate priority, recognizing the expected scale of higher priority issues. All backlog NSR sites are expected to be restocked by the year 2002.

2.1.3.3 PRECOMMERCIAL THINNING

Prince George Supply Block

FRDA and social forestry programs have provided funding over the past 20 years for precommecial thinning (juvenile spacing). Most treatment opportunities in overstocked, high priority stands of natural regeneration origin have been addressed during the past two decades. Future precommercial thinning/cleaning will be focused on pre-1987 plantations. It is expected that approximately 5000 hectares per year of this treatment may be required. Tactical options will includemotor-manual brushing, girdling as well as chemical treatments.

Typically, lodgepole pine stands of establishment densities ranging from 10 000 to 15 000 sph are targetted for precommercial thinning. Precommercial thinning prescriptions call for treatment at stand age 12 to 18 years, and target a residual stand density of 2 000 sph.

Fort St James Supply Block

Precommercial thinning of 21 to 40 year old plantations is expected to accelerate in this supply block. Precommercial thinning regimes are locally variable in the Fort St. James Supply Block. Post treatment spacing is prescribed on the basis of forest health and site occupancy. Where lethal stem rust infections or other pest problems occur, target stand densities are generally 1800 stems/ha.

Stand Management Prescriptions for precommercial thinning in 50 + year old fire origin pine stands generally prescribe 1600 to 1800 sph. An additional requirement ensures that a minimum of 20 m2 of residual basal area is retained in the stand The opportunity treatment area is not currently known, nor is the scale of treatment required to address timber supply issues.

Vanderhoof Supply Block

In the Vanderhoof Supply Block the highest priority for precommercial thinning are stands currently in excess of 10 000 sph (maximum density spacing). Stands of densities between 5000 to 10,000 sph are a lower priority for treatment. Stands less than 5,000 stems per hectare are generally not treated. Residual stand densities are designed to yield the sawlog characteristics described in Section 2.1.2.2.

2.1.3.4 TREE IMPROVEMENT

Genetic gain has not been incorporated in the TSR2 base case for the Prince George TSA. The projected gain from improved seed is presented in Table 2.1.5.

Table 2.1.5 Forecast gain in volume from improved seed for the Prince George Region.

TSA	Species & Seed Zone	Elevation (m)	Gain from Improved Seed (%)		
			98-99	99-00	2007-08
Prince George TSA					
	Pli PG low	<1100	6	6	7
	Pli BV low	<1100	7	7	9
	Sx PG low	<1200	14	15	17
	Sx PG high	<1200	17	17	16
	Sx BV low	<1200	2	3	12
	Fdi PG all	<1100	19	19	19

Source: FGC

2.1.4 TSR 1 MANAGEMENT ASSUMPTIONS

In addition to the inventory, or current state of the forest, assumptions about how it will be managed as are essential for determining a silviculture strategy for the TSA.

2.1.4.1 INVENTORY PROFILE

The species profile for the Prince George TSA is, like most subboreal management units, expected to change under the management regimes projected in the TSR 1 base case. Spruce is expected to displace subalpine fir, and Lodgepole pine will likely increase in proportion to spruce.

In the Fort St. James Supply Block, lodgepole pine has, in the past, been considered the most desirable species on appropriate sites because of shorter rotations. Many areas of harvested Douglas-fir have been re-established as pure pine stands. As a result of LRMP and forest health issues this practice is expected to change. An objective of the Fort St. James Land and Resource Management Plan is to maintain or expand the range of Douglas-fir. Further, forest health problems with pine may be partially offset by establishing mixed stands. The proportion of lodgepole pine in the inventory is therefore expected to decline slightly over the medium term, while spruce and Douglas-fir components will increase.

2.1.4.2 MANAGEMENT ZONES AND FOREST COVER REQUIREMENTS

The TSR management zones and their associated forest cover requirements are listed in Table 2.1.6 and the minimum harvest ages are summarized in Table 2.1.7.

Table 2.1.6 Management zones and forest cover requirements.

Management Zone	Maximum Allowable Disturbance (% area)	Green-up height (metres)	Minimum retained area (%)	Minimum age for retention (years)
VQO - retention	4	5	N/A	
VQO – partial retention	11	5	N/A	
VQO - modification	21	5	N/A	
VQO – maximum modification	33	5	N/A	
Vanderhoof LRMP - special	20	3	N/A	
Caribou – medium (Prince George Forest District)	33	3	33	80
Caribou – corridors (Prince George Forest District)	20	3	20	100
Aleeza Lake Research Forest	25	3	25	110
Herrick FENS	25	3	25	120
Other integrated management areas	25	3	N/A	
Source: TSR Prince George Data Package 1998, p39.				

Table 2.1.7 Minimum harvestable ages by leading species.

Species	Minimum Harvestable Age (years)
Spruce	>101
Pine	>81
Fir	>111
Balsam	>121
Cedar	>111
Hemlock	>111
Deciduous	>61
Source: TSR Prince George Data Package 1998, p30.	

2.1.4.3 HARVESTING PRACTICES

Table 2.1.8 indicates the approximate apportionment of the annual harvest within the three supply blocks of the TSA. There is considerable variation, year-to-year in these proportions, largely driven by forest level dynamics caused by fire and pests and local economy.

Table 2.1.8 Harvest apportionment in the Prince George TSA[5]

Supply Block	Current Harvest Area (ha)	Current Harvest Volume (m^3)
Prince George	16 000	4 500 000
Vanderhoof	7 000	1, 930,000[6]
Fort St. James	12 000	3 200 000[7]
Total	35 000	9 630 000

2.1.5 TIMBER SUPPLY DYNAMICS AND THE AAC

The 1995 TSR shows an even-flow harvest level which can be maintained throughout the entire planning horizon (Figure 2.1.3). The base case harvest forecast level is 9 630 000 m^3 per year. This level is 3% above the current AAC of 9 363 661 m^3 per year resulting from the 1996 Rationale for AAC Determination. The base case harvest forecast is the maximum non-declining harvest level that can be achieved without resulting in future shortfalls.

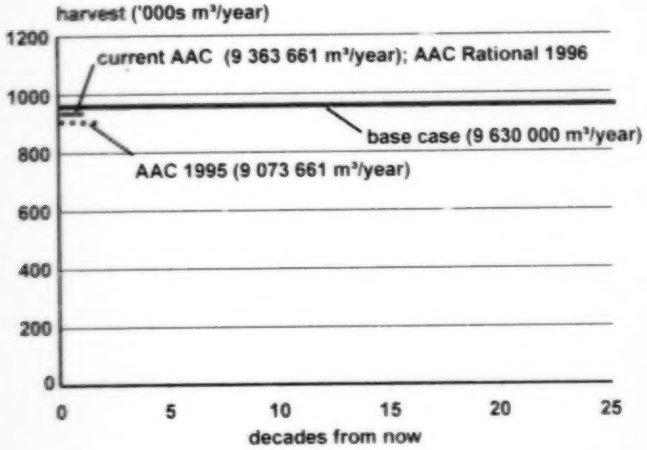

Figure 2.1.3 **Base harvest forecast, Prince George TSA.**

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[5] Figures are approximate only; cut is shifted throughout the TSA in response to pest and salvage priorities.

[6] Includes a non-renewable license to cut small pine (L&M Lumber Co. Ltd.) of 290 770 m^3.

[7] Currently undercut due to mill shutdowns in 1999.

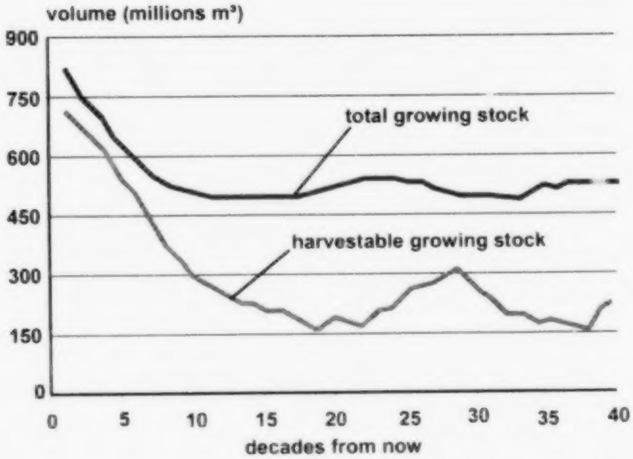

Figure 2.1.4 **Changes in growing stock over time, Prince George TSA.**

Figure 2.1.4 illustrates that the total growing stock for the base case harvest level can maintained at a constant level from year 100 to the end of the planning horizon. This demonstrates that the harvest level is near the productivity level of the timber harvesting land base.

2.1.6 KEY ISSUES AND POTENTIAL SILVICULTURAL STRATEGIES

This section identifies the key Sustainable Harvest issues facing the TSA, as well as potential silvicultural strategies suitable for addressing them. Of those resource supply issues described in Section 2.1.2, five are considered key by management unit stakeholders:

- Potential mid-term timber supply gaps.
- Reduced productivity of backlog stands in the timber supply landbase.
- Lodgepole pine managed stand pest losses.
- Repression-related productivity losses of existing pine stands.
- Potential decline in the quality of the timber supply.

Tables 2.1.8 and 2.1.9 identify the issues that could be addressed through specific silvicultural strategies, targetted stand types, recommended silvicultural tactic(s), potential annual levels of investment, potential benefits and overall TSA investment priority. Actual investment priorities recommended for each Forest District within the Prince George TSA (Section 2.7) vary, depending on the district-specific nature of many of the issues. In all cases, local technical expertise, current policies and present uncertainties surrounding some potential strategies are reflected in SH investment recommendations.

Issues that were identified as requiring investigation prior to silvicultural action are discussed in Section 2.1.10.

2.1.6.1 ISSUE 1: POTENTIAL GAPS IN MID-TERM TIMBER SUPPLY

Strategy 1: Move Existing Stands Ahead in Harvest Queue.

TACTIC 1 THIN AND FERTILIZE MODERATELY REPRESSED 40-70 YR-OLD PINE STANDS (CURRENTLY IN THE THLB)

Target Stands:

Moderately repressed 40-70 yr pine stands (currently in THLB).

Expected Forest Level Benefits:

The full potential for this treatment is not yet known. Conservative estimates for thinning alone, which is currently being carried out on a limited basis in the Fort St. James Supply Block, are that stands will be available for harvest two decades earlier than with no treatment. A thinning program of 200 ha/yr for the next 10 years would provide 2000 ha for harvest in the mid-term that would not otherwise be available.

A study is recommended to investigate the effects on fertilizing these stands (or applying multiple fertilizer treatments alone). If the stands show a standard fertilizer response, there is the potential for an extra 10-15 m^3/ha for each fertilizer application. If, in addition to the expected fertilizer response there is an added effect of partially or complete reversing overcome density related repression as has been observed in some younger stands, the benefits could be much greater.

TACTIC 2 PRECOMMERCIAL THIN PREPARATION FOR FUTURE COMMERCIAL THINNING

Subject to the known biological limitations of stand density management theory, some reduction in the age of operability, and improvement in commercial thinning economics can be gained by precommercial thinning to a residual density which permits intermediate entries. Caution, and careful analysis is advised in the implementation of this tactic.

Strategy 2: Increase Volume Yields of Existing Stands

TACTIC 1 FERTILIZE THRIFTY JUVENILE STANDS ON 10-YEAR CYCLE

Fertilizing stands currently 20-40 years old on a repeat cycle of 10 years will make these stands available for harvest sooner. Target stands include spruce and pine stands on medium and good sites. Assuming a conservative volume gain of 10 m^3/ha for each treatment, an average MAI of 4 m^3/ha/yr, and four fertilizer treatments, stands will be ready for harvest with the same volumes 10 years earlier than without treatment.

Table 2.1.8 Possible silvicultural strategies to mitigate key Prince George TSA issues

Key Issue	Issue Description	Objective	Silvicultural Strategy	Silvicultural Tactics	Target Stands	Rank
Mid-term gap in fibre supply	Localized shortfalls are forcing large scale spatial shifts in industrial operations	Make more timber volume available in mid-term.	Move Stands up in Harvest Queue (increase operability)	Thinning Fertilization	moderately repressed 40-70 yr pine stands (currently in THLB)	11
				PCT preparatory to CT	15-20 yr old Pl on medium and good sites	5
			Increase Volume Yields	Fertilize on 10-yr cycle	20-40 yr old thrifty Sx, Pl in PG supply block, on medium and good sites	10
				Fertilize on 10-yr cycle	40-60 yr old thriftySx and Pl pole size stands in PG supply block on medium and good sites	10
				Survey IU Stands Reclassify/Harvest IU Stands	old Intermediate Utilization (IU) harvest units	3 4
Productivity of Backlog stands	Treatment of backlog is mandatory and already assumed in TSR--a "must do" for the District.	Eliminate existing backlog NSR and maximize yields.	Maintain Productivity ofTHLB Land Base	Survey and reclassify	Areas labelled backlog NSR	1
				Site preparation Planting brushing	Areas surveyed and classed backlog NSR	2
				Brush/space	Backlog impeded stands in PG supply block	1
				Brush/space	Backlog impeded stands in Vand. supply block	2
				Brush, space	Backlog impeded areas in FSJ supply block	2
				site prep, plant under canopy or in voids	Backlog stands supporting aspen stands	8
				Site prep plant IU	old Intermediate Utilization (IU) harvest units	8
Managed Stand Pest Losses	Losses to Western gall rust	Reduce losses from Western gall rust	Minimize Stocking Losses due to Infections	Prune infected branches	pre-87 SR pine in FSJ and V and. Supply blocks	7
				Monitor/Map risk due to forest health hazards	All managed stands	6
Repression Losses	Density-related repression may reduce stand productivity so that stands are netted out of the THLB	Reduce, reverse, or eliminate effects of repression on existing stands	Increase THLB/increase yields by treating repressed Pli stands to make them operable/replacing them with normal stands	Survey	30 - 40 yr old fire origin, overstocked pine	5
				Reclassify, bring into THLB, early harvest		5
				Rehabilitate and plant		5
				Thin, fertilize		5
Maintaining Timber Quality	Clear lumber is about 3 or 4 times greater than similar wood containing knots	Diversify log products from TSA by producing small amounts of clear lumber	Clearwood pruning	Branch pruning, single lift	Pine on highest sites in TSA (24 m +)	12

Table 2.1.9 Key issues, silvicultural strategies and tactics, and their potential impact on resource supply in the Prince George TSA.

Key Issues	Silvicultural Strategies	Silvicultural Tactics	Opportunity	Timber Supply Effects			Quality	Habitat	Jobs	Cost	Priority
			Area (ha/yr)	Short	Medium	Long			Days/ha	$/ha[1]	Rank
				0-20	21-120	121+					
Mid-term gap in fibre supply	Moves Stands up in Harvest Queue	PCT and/or fertilizing (moderately repressed Pl)	200		+	+	+	+	3.0	562	11
		IU Stand Surveys	5 000						0.05	32	5
		IU Stand Reclassification and harvesting	3 200		++++			-			3
		Pre-commercial thinning (PCT)	2 400						3.0	562	4
		Fertilizing thrifty juvenile stands	300		++	+	+	+/-	0.1	443	10
		Fertilizing thrifty pole-size stands	300						0.1	443	10
Productivity of Backlog Stands	Maintain Productivity of THLB	Surveying and reclassifying	66 000		M	M			0.05	32	1
		Site preparation, planting, brushing	1 800		M	M			4.5	2 027	2
		Brushing, spacing (Dpg)	9 000		M	M		+/-	5.0	1 100	1
		Site preparation, fill planting (aspen)	150			+			2.5	1 450	8
		Site preparation, fill planting (old Intermediate Utilization blocks)	150			+			2.5	1 450	8
Managed Stand Pest Losses	Minimize Stocking Losses	Pruning infected branches	150		M				4.0	1 188	7
		Rust Monitoring	TSA		M	M					6
Pine Repress.	Incr. THLB/Yield	Surveying	1 500						0.05	20	5
		Reclassifying	1 200		++	++		+			5
		Rehabilitating and planting	500		++	++		+	2.5	1 300	5
		Thinning, fertilizing	300		++	++	+	+	3.0	500	5
Timber Quality	Clear Wood Pruning	Pruning	170				++	-	4.0	1 188	12

A program which initiates this treatment regime on 300 ha/yr over the next 10 years would provide 3 000 ha that is available for harvest one decade sooner than without treatment.

TACTIC 2 FERTILIZE THRIFTY POLE-SIZED STANDS ON 10-YEAR CYCLE

Fertilizing stands currently 40-60 years old on a repeat cycle of 10 years will provide additional volume when these stands are harvested in the mid-term. This will provide increased flexibility in harvest scheduling of the rationed old growth. Assuming a conservative gain of 10 m^3/ha for each treatment and four treatments, each hectare treated will provide an extra 40 m^3. A program which initiates this treatment regime on 300 ha/yr over the next 10 years is expected to result in an extra 120 000 m^3 of available volume during the mid-term.

TACTIC 3 SURVEY/RECLASSIFY/SCHEDULE FOR SALVAGE HARVEST OLD INTERMEDIATE UTILIZATION (IU) HARVEST UNITS

Target Stands:

Residual stands resulting from 30 –40 year old intermediate utilization harvesting.

Expected Forest Level Benefits

Many areas harvested either to intermediate utilization standards (circa 1963-1970) and those harvested earlier under a variety of partial cutting regimes have uncertain stocking and rates of growth. Some are growing well, are not adequately recognized in the inventory, and will be available for harvest in the mid-term. Others which are growing poorly still have sufficient volume for harvest either now or in the mid-term; harvesting these stands provides greater flexibility in harvesting the rationed old growth.

Benefits of this tactic include increases to the THLB (where stands are either misclassified as having a low site index or have insufficient stocking to produce minimally harvestable volume), increases in MAI through accelerated conversion to more productive stands, and increased harvest flexibility in the mid-term. There are approximately 25 000 ha of old harvesting units remaining in this category, approximately 16 000 of which can be dealt with through re-classification.

2.1.6.2 ISSUE 2: REDUCED PRODUCTIVITY OF BACKLOG STANDS IN THE THLB

Strategy 2: Maintain the Productivity of the Timber Harvesting Land Base

TACTIC 1 BACKLOG SURVEYS/RECLASSIFICATION

and

TACTIC 2 BACKLOG SITE PREPARATION/PLANTING/BRUSHING

Target Stands:

Areas labelled backlog NSR

Expected Forest Level Benefit:

A program of 66,000 ha per year of surveys will facilitate reclassification of existing backlog NSR, and support planning for necessary silvicultural improvement treatments.

A program to initiate a site prep/plant/brush sequence is required at a rate of 1800 ha/yr. This rate is faster than that currently assumed in TSR and may increase harvesting flexibility in the late mid-term and early long term.

TACTIC 3 ENHANCEMENT OF BACKLOG ASPEN STANDS

Target Stands:

Backlog stands supporting aspen stands

Expected Forest Level Benefits:

Backlog stands that have regenerated to aspen and have been accepted as aspen stands at least for the current rotation can be enhanced for volume production either by under-planting with spruce or by planting spruce in canopy voids. In both situations, the successive conifer rotation will be shortened by 10-30 years due to the use of an already-established crop. A program of 150 ha/yr is thought to be possible.

TACTIC 4 ENHANCEMENT OF YIELD ON IU RESIDUAL STANDS

Target Stands:

Residual IU stands with inadequate stocking or potential yield.

Expected Forest Level Effect

Some IU residual stands poorly stocked (insufficient trees of an ecologically suitable species) and require restocking. Treatment. This will both increase the productivity of the stand and increase stand operability. These stands should be scheduled for prompt treatment such as fill planting or underplanting. This could potentially improve stand volume yields in the medium term. A program of 150 ha/yr is recommended.

TACTIC 5 BACKLOG IMPEDED BRUSHING

Target Stands:

Backlog impeded stands throughout the TSA.

Expected Forest Level Benefits:

A program of 9 200 ha/yr of brushing and spacing (pre-commercial thinning) is required (5 000 ha/ yr in Prince George, 2000 ha/yr in Vanderhoof and 2 200 ha/yr in Ft. St. James Supply Blocks).These treatments will ensure that currently established stands are meeting the expectations already assumed in TSR.

2.1.6.3 ISSUE 3: LODGEPOLE PINE MANAGED STAND PEST LOSSES

Strategy 1: Reduce Stocking Loss Impact of Rust Infected Pine Stands

Strategies to protect forest health are intended to maintain conditions favorable for maximizing timber production. Avoiding pest problems will help maintain productivity levels already assumed in TSR, thus no gains per se are expected.

TACTIC 1 INFECTED BRANCH PRUNING

Stands heavily infected with western gall rust can be treated to reduce impacts of branch infections that will eventually be engulfed in the bole of the tree. Such infections reduce lumber yield and can cause tree mortality. Pruning infected branches will reduce losses. A program of treating 150 ha/yr is thought possible, primarily in Fort St. James and Vanderhoof Supply Blocks.

Strategy 2: Pest Distribution Prediction and Decision Support

TACTIC 1 FOREST HEALTH HAZARD MAPPING

A project to enhance current efforts in mapping forest health hazards is needed to improve both silvicultural planning specifically and forest management planning generally. This is a risk management function needed to help both direct and protect forest investments.

2.1.6.4 ISSUE 5: REPRESSION LOSSES IN EXISTING PINE STANDS

Strategy 1: Reduce/reverse/eliminate Repression in Existing Stands

TACTIC 1 REPRESSED STAND SURVEYS

and

TACTIC 2 RECLASSIFICATION

and

TACTIC 3 THINNING AND FERTILIZATION

and

TACTIC 4 STAND REPLACEMENT

Target Stands:

30 - 40 yr old fire origin, overstocked Lodgepole pine stands throughout the TSA.

Expected Forest Level Benefits:

Density related repression of lodgepole pine reduces volume production by dramatically slowing stand development. Stands with light and moderate levels of repression are still included in the THLB, but projected volume production is well below site potential (a reduction in apparent SI50 from 20 to 15 will result in roughly a 50% loss in MAI). Stands with high levels of repression may be excluded from the THLB due to a low apparent site index, even though potential SI50 may be 18 or more.

Approximately 500 ha/yr of 30-40 year old, fire origin pine stands should be surveyed in the Prince George Supply Block, in order to provide a basis for deciding whether retain the stand, or rehabilitate and reforest. It was estimated that approximately 300 ha of each 500 surveyed would be left and scheduled for an early harvest as pulpwood. The benefits of this treatment would be an immediate increase in the THLB through rehab treatments (approx, 200 ha/yr for 10 years) with a further 3 000 ha being returned to the THLB as pulpwood stands are harvested over a time horizon of 10 to 50 years. Volume harvested as pulpwood from these stands (80-120 m^3/ha) would increase harvest flexibility in the rationed old growth.

In the Vanderhoof Supply Block approximately 1 500 ha/yr of 30-40 year-old fire origin pine stands should be surveyed. Of this, it is estimated that 900 ha/yr will be reclassified as productive, while 300 ha/yr will be thinned and fertilized, and 300 ha/yr will be rehabilitated and reforested. All areas will be returned to the THLB either through reclassification or stand improvement.

There is a sustantially larger inventory of similar stands in the Fort St. James Supply Block. Similar treatment decisions are expected. A pilot program of precommercial thinning over the next 5 years combined with fertilizer treatments in the thinned stands is suggested to improve harvest flexibility in the mid-term. Volumes removed from these stands during possible commercial thinning in the short term future would improve options for rationing old growth. Subsequent refertilization following CT could partially partially replace CT volume removals.

2.1.6.5 ISSUE 6: DECLINING QUALITY OF TIMBER SUPPLY

Strategy 1: Prune to Produce Clear Lumber

TACTIC 1 CLEAR WOOD PRUNING

target Stands"

Superior Lodgepole pine stands of the highest site productivity potential in the TSA (> 24 m @ 50 years)

Expected Forest Level Benefits:

Clear lumber is commonly valued 3-4 times greater than similar wood containing knots. Trees pruned to produce clear lumber have the potential then to yield higher stumpage values than non-pruned trees (although regimes to prune trees in interior BC stands are typically financially non-viable or highly risky). Expected benefits from a conservative pruning program include short term employment and future product diversification. A program of 170 ha/yr is suggested, to be directed to the 5% top productivity lodgepole pine sites (>24 m @ 50 years), and most biologically responsive stands.

2.1.6.6 RECOMMENDED KNOWLEDGE STRATEGIES

There are many related TSA silvicultural issues which are not directly addressable via silvicultural practices. Many of these require investigation and further study. Table 2.1.9 identifies, and ranks the importance of 12 Sustainable Harvest knowledge gap issues.

Table 2.1.9 Silvicultural issues requiring study.

Sustainable Harvest Knowledge Gap Issue	Priority
OAF study for plantations There is concern regarding the use of Provincial default OAF 1 values for TSR yield determinations using TIPSY for managed stands. A sampling strategy is required to obtain locally accurate OAF 1 estimates. This will serve a dual purpose: a) it will provide better estimates of local managed stand yields for use in TSR, potentially stratified by stand type, ecosystem unit or year of stand origin (i.e. pre 1983, 1983 to 1987, post 1987). b) it has the potential to affect reforestation practices (current and backlog sites) by highlighting areas of concern related to stocking and associated yield impacts.	1
Growth and yield of managed stands for pure and mixed stands A program is needed to establish permanent sample plots for growth and yield in managed stands. No such program currently exists. Data sets are required to monitor growth in pure and mixed species/complex stands at stocking levels similar to those currently being established in managed stands – such stands are rare in the existing data sets predominated by natural stands. This data is necessary for calibration/validation of models such as Prognosis^{BC} and MGM.	1
Improved SI estimates for disturbed sites There is concern regarding the accuracy of SI data for disturbed sites. Better SI data is required on most openings so that accurate estimates of managed stand yields can be determined in the TSR process, and appropriate silviculture investment decisions can be facilitated. For units in which surveys are scheduled in the near future, this means ensuring that appropriate data is collected and the best available method of SI estimation is used. It was also suggested that the method of SI estimation be recorded and tracked to provide indications of reliability. For stands which are not scheduled for surveys in the near future (i.e. free growing stands), other methods will be required.	2

OGSI paired plots; local paired plots required There is concern amongst stakeholders over the use of localized (TSA OGSI corrections derived from broad (provincial) scale averaging of data. It should be noted, however, that OGSI adjustments affect only managed stand yield projections, and in most cases have no impact on short term harvest forecasts. Compared to currently available OGSI adjustments, the improved information provided by further sampling would primarily refine prediction of the LTHL, with minor adjustments possible in mid term forecasts. There is little if any opportunity to impact current practices or short term supply projections.	5
Improved data tracking and inventory updates; There is concern over the lack of data links between the silviculture reporting system (ISIS) and the inventory system. In particular, SI data from silviculture surveys is not always being transferred into the inventory system, and where transfer does occur there are often delays of several years. It should be noted, however, that while it is important to get accurate information from surveys into the inventory, delays in doing so have no impact on current practices. The largest impact of outdated information in the inventory is to predictions for the LTHL, with only minimal impacts if any on short term harvest level projections. Where the data exist, it is probable they will make it into the inventory long before it has an impact on short term harvest levels.	4
ISIS Improvements There is concern regarding the accuracy of information in the ISIS database, particularly related to areas (sum of strata not equal to total) and disparities between opening files and ISIS records. An audit of the ISIS database is required to assess potential impacts of planning errors that could result from erroneous information, and to recommend improvements to the data management system.	3
Repressed 40-70 year old fire origin pine, thinning and fertilization trial. The practice of thinning 40-70 year old repressed pine stands has been viewed as risky from an investment stand point due to doubts about treatment response. There is some indication that fertilizer applications can dramatically improve treatment gains. ***A controlled trial is required to assess efficacy of thinning and fertilization treatments.*** Monitoring of disease (stem rust) effects in such trials was also suggested.	3
Fertilization trials in white spruce stands. There is widespread interest in fertilizing white spruce stands, but few response trials have been established. ***There is a need for white spruce fertilizer response data for all stand ages.*** Monitoring is also required to asses interaction of fertilizer application with pests of white spruce, in particular with the white pine weevil but also with small mammal damage.	3
Monitor intensive fertilization/CT regimes. An increase in commercial thinning is expected in the near future, providing opportunities for potential gains in mid-term timber supplies through fertilization. ***Controlled trials are required to asses fertilizer response in commercially thinned stands (all species).***	3
Studies to collect better SIBEC data Accurate SI estimates are required for making informed decisions on silvicultural investments and for properly forecasting future timber supplies. In many stands, the only source of SI estimates is through correlation with site series. Currently, these relationships are weak or non-existent for many ecosystem units. SI values are often important criteria in making current silviculture investment decisions, and in many cases for juvenile stands SIBEC at least has the potential to provide the best estimate of SI. Also, in many cases correlation with SIBEC will be the source of the SI estimate that is carried in the inventory through the next rotation, particularly in stands where free growing status is achieved before a growth intercept estimate of SI can be completed. It is very important, therefor, that we immediately improve our SIBEC estimates of SI. ***More data collection is required to improve SI estimates for those sites that are currently poorly supported in the SIBEC database.***	2
Inventory audit/ VRI – accuracy of stand heights There is concern in the Vanderhoof Supply Block over potential height estimate errors in the inventory leading to errors in estimating yields of existing stands projected using VDYP; an audit is required to asses the magnitude of this problem. The problem may also be adequately addressed during VRI sampling, although a VRI has not yet been scheduled.	5
ESSF establishment and growth There is concern regarding regeneration performance in high elevation stands. While some studies have been conducted, more work is required to assess growth rate expectations for these stands in the ESSF zone. Of particular concern is for projected times (years) to green-up height.	6

2.2 ROBSON VALLEY TSA SUSTAINABLE HARVEST ISSUES AND SILVICULTURAL STRATEGY

This section describes the key sustainable harvest issues in the Robson Valley TSA, and defines a provisional silvicultural strategy to address them. The following strategic analysis is based on a recently completed Type I Silvicultural Analysis, but requires further, detailed forest analysis and modelling in a Type II analysis. This step is currently underway, and the results will be incorporated into the 2002 Sustainable Harvest RMP. In the meantime, this provisional strategy is reflected in the proposed, 5 year Sustainable Harvest Plan for the Robson Valley Forest District (Section 2.8).

2.2.1 THE RESOURCE LAND-BASE

The Robson Valley TSA covers 1,235, 821 hectares, of which 209,365 (17%) is considered to be in the timber harvesting land base.

The site class profile of the timber harvesting land base is: 54% poor, 30% medium and 16% good site.

The current age class profile (Figure 2.2.1) of the timber harvesting land base is skewed toward older age classes. Over 70% of the stands are 100 years of age or older, and 60% of the stands are 200 years of age or older.

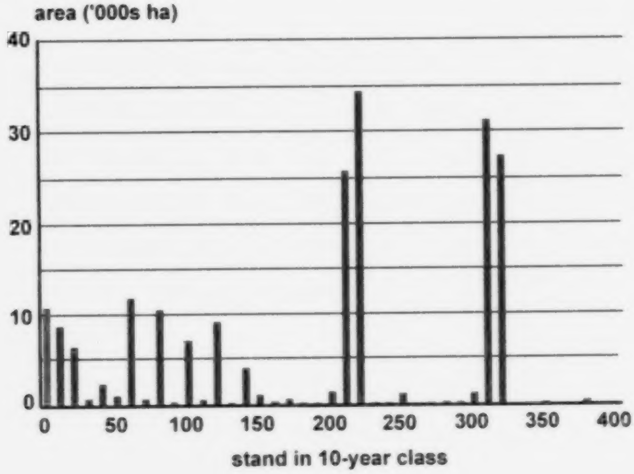

Figure 2.4.1 **Current age class distribution—timber harvesting land base, Robson Valley TSA 1994**

The tree species profile (Figure 2.2.2) on the timber harvesting land base is approximately 45% spruce, 19% sub-alpine fir, 13% lodgepole pine, 10% western red cedar, 8% western hemlock, and 5% Douglas-fir. Spruce stands over 100 years of age account for more than 33% of the timber harvesting land base.

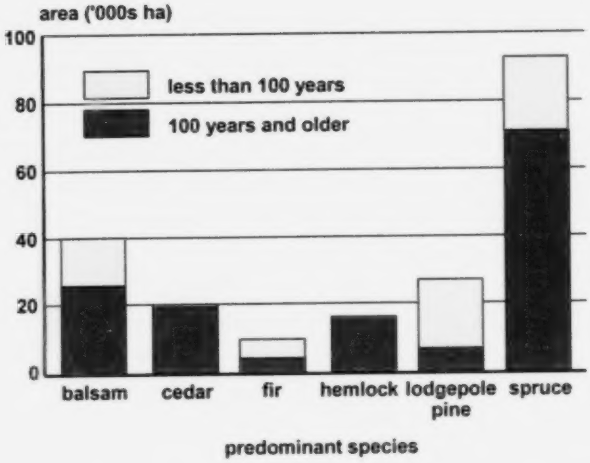

Figure 2.2.2 **Current species composition – timber harvesting land base, Robson Valley TSA 1994.**

The Watersheds BC database classifies forests stands by age and disturbance, and is useful for identifying habitat issues. In Figure 2.2.3, old forests are defined as age >140 years, young forests are age <140 years, recently logged forests are age ≤ 20 years, selectively logged forests are forests selectively logged during the last 20 years, and burned forests are forests burned during the last 20 years. The maps used to create this database were based on data from 1992-1993. Therefore any areas burned or logged in the last 6 or 7 years are not reflected by this data. Figure 2.2.3 illustrates the concentration of harvesting on low slope gradient forests in the last 20 (27) years.

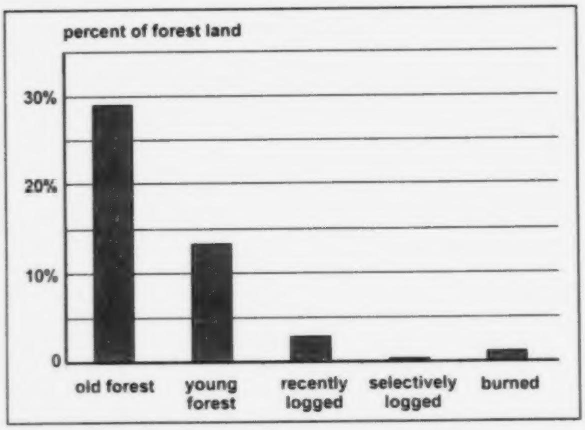

Figure 2.2.3 **Forest classification—timber harvesting land base, Robson Valley TSA 1994.**

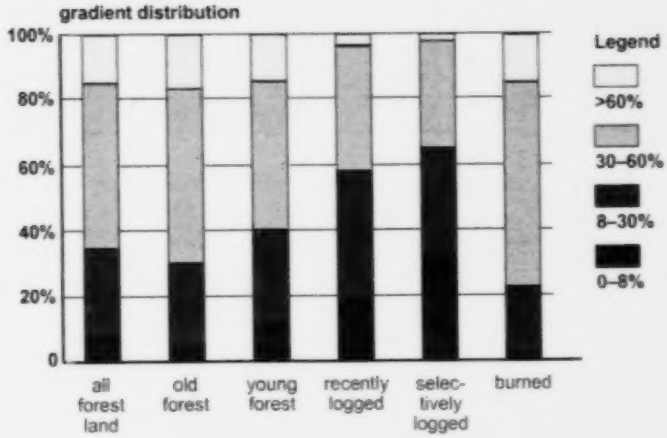

Figure 2.4.4 **Slope gradient of forest classification —timber harvesting land base, Robson Valley TSA 1994.**

2.2.2 RESOURCE SUPPLY ISSUES

2.2.2.1 TIMBER SUPPLY – VOLUME

The timber supply is declining. The most important factor is the abundance of old growth timber that has allowed harvesting above the long-term harvest level. The regenerating stands will be harvested at a younger age and smaller size than the old growth stands, and there will be less timber volume available to harvest. Forest cover requirements for other resources such as wildlife habitat and visual quality also limit timber harvesting.

Existing stand volumes - Sensitivity analyses performed for the 1994 timber supply review indicated that the short-term timber supply is very sensitive to changes in volumes of existing stands. Even moderate changes in assumptions resulted in initial harvests more than 40% lower than the base case or conversely, the initial harvest level being maintained for 3 decades. CH types and higher elevation SB were specifically identified in the workshop as having low volumes, and the SB may have less spruce than indicated by the type label.

Visually sensitive areas – Advance TSR2 results described by participants suggest that VQOs will have a substantial impact on the timber supply and methods to mitigate these effects are a high priority. Managing visual quality is an important issue in the district particularly in the Rocky Mountain Trench, and adjacent to Jasper National Park and the provincial parks that surround the district. Harvesting and silviculture operations must conform with the visual quality objectives. In the trench they are primarily retention and partial retention.

Unsalvaged losses – Unsalvaged losses in TSR1 were estimated at 70 500 m^3 but have increased to 98 600 m^3 in TSR2. Of the TSR2 unsalvaged losses, 53 056 m^3 (57%) is insect related, predominantly due to hemlock looper.

Biodiversity constraints – Forest cover constraints in TSR2 have increased substantially and can be expected to constrain timber supply from natural stands.

Other uncertainties – TSR1 indicates that uncertainties about minimum harvestable ages, green-up requirements, and visual quality objectives have moderate impacts on short-term harvest levels, while uncertainty about regenerated yields has a moderate impact on long term harvest level.

2.2.2.2 TIMBER SUPPLY – QUALITY

No studies on timber quality have been completed for Robson Valley District and no information on timber quality is available from the 1994 timber supply review. It is noted, however, that low volume CH and high elevation SB stands are of low quality.

2.2.2.3 HABITAT SUPPLY

Riparian values – There are areas in the TSA that have significant portions of streams logged to the bank. These are obvious areas for some silvicultural investments to stabilize banks, grow shade for the streams and restore the functioning of streamside vegetation as habitat and the energetics of stream foodchains. Accompanying maps highlight those areas that have the highest level of streamside logging. In the 7 years since the data was collected for this map, there has been additional logging, some of it prior to the implementation of FPC riparian standards. This activity may have put other watersheds at risk.

Cedar – Hemlock stands– The Robson Valley TSA represents some of the furthest extent of the ICH biogeoclimatic zone. Examples of this zone are often old cedar-hemlock stands that are not desireable for timber, but are good wildlife habitat. Old looper killed or damaged stands are ideal for cavity nesters. This damage represents a large stand-initiating event. Shade tolerant species are coming up in these stands. Logging these areas means conversion to spruce stands. Because these stands are part of the timber harvesting land base, the chief forester has admonished the district to cut these areas in the proportion in which they are found (17%) or else they may be removed from the THLB in the next determination (i.e. a lower AAC). From a habitat point of view, removal of these stands from the THLB is the preferred solution.

Mountain Caribou – The Robson Valley is at the northern end of the range of mountain caribou in BC. These arboreal lichen foraging caribou are considered at risk in the province. There is a system of zonation for caribou habitat in the TSA including zones for high value habitat (deferral or no logging), medium value (small patch cutting or group selection) and corridors (no more than 10% not greened up). Further silvicultural investments may be suggested by some research currently underway (S. Stevenson, M. Jull, D. Coxson, H. Armleder and B. McClellan). Recommendations will be forthcoming from this group at the end of the current fiscal year . They will be published by MOE and/or MELP.

The bottom line is that the best strategy for mountain caribou is not to log at all. If you are determined to log, then partial cutting techniques that remove clumps of trees will maintain some of the habitat values. Specifics about ways to log will be in the recommendations. If high value habitat has already been logged, then possible techniques for restoring the habitat as quickly as possible include planting and thinning to create clumpiness and maintaining this clumpiness through partial cutting techniques.

Lichens require light. Thinning allows light to penetrate into the stand and allows lichens to grow on more surfaces than just the top of the canopy. Canopies that are partially defoliated also have a beneficial effect on lichen growth.

Grizzly Bear – Stocking standards in grizzly bear habitat should be examined to make sure stands are not so dense as to exclude the growth of forage species (berry producing deciduous shrubs and trees and herbaceous plants). Herbicides should not be used in these stands.

2.2.2.4 RESOURCE EMPLOYMENT

Employment is also an important issue as the number of timber harvesting jobs has decreased significantly in recent years, and will likely continue to decrease as the timber supply declines. Silviculture employment, however, favours non-local crews due to the short employment season. Residents dependent on the forest industry occupy higher paying harvesting jobs or leave the district.

Timber supply is often the dominating issue on British Columbia management units. The objective of this section is to identify aspects of the timber harvesting land base and its management that govern the supply of timber from the TSA. This information provides the basis for identifying the constraining mechanisms that shape the timber supply forecast for the unit and for specifying possible silvicultural remedies. Unless otherwise indicated, the data in section is drawn from the Robson Valley TSA Timber Supply Analysis (1994).

2.2.3 SILVICULTURAL PRACTICES

2.2.3.1 SILVICULTURAL HISTORY

Table 2.2.1 records both backlog (pre-1987 openings) and incremental silviculture for the TSA. From 1990 to 1999, a total of 14.4 hectares were pruned (first lift) in 1998. Potential for incremental pruning is unknown. The pruning that was proposed in the FRBC resource management plan is to treat for blister rust in young white pine stands.

Table 2.2.1 Backlog and incremental silviculture history 1990-99 , Robson Valley TSA.

Year	Backlog Planting (ha)	Backlog Brushing (ha)	Juvenile Spacing (ha)
1990	2763	323	53
1991	548	544	76
1992	178	472	228
1993	100	134	25
1994	440	329	0
1995	39	199	0
1996	267	438	0
1997	0	198	0
1998	32	28	14
1999	4	10	0
Total	**4,371**	**2,674**	**396**

2.2.3.2 BACKLOG SILVICULTURE

Backlog treatments have consisted of primarily planting and brushing. See Table 2.2.1 for annual details. The area of backlog not satisfactorily restocked land is 1515 ha according to the TSR2 data package.

2.2.3.3 PRECOMMERCIAL THINNING

There is no "typical" precommercial thinning (juvenile spacing) regime in the district. There is no incremental plan where stands are targeted for treatment. In 1997 the district began to identify candidate stands, but the enthusiasm for the project waned when the District's forest renewal funding was discontinued. While licensees would like to undertake incremental work, the current priority is to brush impeded stands and conduct silvicultural surveys. If funding were not a concern, approximately 300 hectares could be precommercially thinned per year.

2.2.3.4 TREE IMPROVEMENT

Genetic gain has been considered through sensitivity analysis in TSR2 as a yield increase of 18% for all spruce planted from after 1999. The projected gain from improved seed for the Robson

Valley TSA is listed in Table 2.2.2. Note that A class pine or Douglas fir seed has not yet been planted on the TSA but is included in Table 2.2.2 to demonstrate potential gains.

Table 2.2.2 Forecast gain in volume from improved seed for the Robson Valley TSA

	Elevation	Gain from Improved Seed (%)		
Species & Seed Zone	**(m)**	**98-99**	**99-00**	**2007-08**
Pli PG low	<1100	6	6	7
Sx PG low	<1200	14	15	17
Sx PG high	<1200	17	17	16
Sx NE low	<1300	2	4	12
Sx NE high	1300 - 1700	2	5	13
Fdi QL all	all	9	9	9

Source: Forest Genetics Council

2.2.4 TSR1 MANAGEMENT ASSUMPTIONS

In addition to the inventory, or current state of the forest, assumptions about how it will be managed are essential for defining the silviculture strategy.

2.2.4.1 INVENTORY PROFILE

The inventory profile (species composition) of the timber harvesting land base will change over time with harvesting and replanting. Table 2.2.3 indicates the trend in species profile resulting from the harvesting schedule of the TSR base case.

Table 2.2.3 Current inventory profile and conversion trends, Robson Valley TSA 1994.

	Percent of Inventory			Future
Species	**Present**	**Future**	**Conversion**	**Rounded**
S	44	83		80
Bl	19	4	(15% to S)	5
Pl	13	7	(6% to S)	5
Cw	10	0	(2% to Fd, 8% to S)	3
Hw	9	0	(9% to S)	2
Fdi	5	6	(2% from Cw, 1% to S)	5
Total	100	100		100
Source: TSR Robson Valley TSA Timber Supply Analysis 1994				

2.2.4.2 MANAGEMENT ZONES AND FOREST COVER REQUIREMENTS

The TSR management zones and their associated forest cover requirements are listed in Table 2.2.4 and the minimum harvest ages are summarized in Table 2.2.5.

Table 2.2.4 Management zones and forest cover requirements, Robson Valley TSA 1994

Management Zone		% THLB Area	Height 1 (meters)	Age 1 (years)	Maximum % area younger than Age 1	Height 2 (meters)	Age 2 (years)	Minimum % area older than Age 2
1	landscape partial retention	12.0	5	26	10			
2	landscape retention	1.4	5	26	3			
3	caribou - high	0.0		100%	Excluded			
4	caribou- moderate	7.5	3	27	33		80	67
5		2.0		Partial	Cut zone			
6	reserve	0.0		100%	Excluded			
7	landscape modification	7.1	5	26	25			
8	IRM	65.2	3	23	33			
9	old-growth	4.8	3	22	25		200	5

Source: TSR Robson Valley TSA Timber Supply Analysis 1994, p60.

2.2.4.3 HARVESTING PRACTICES

The average area harvested is 1 858 ha/ year. This was calculated using the total volume logged by all licensees in the last five years (2 443 898 m3) divided by an estimate of the average volume (263 m3/ha) which equals the total area harvested over 5 years (9 292 hectares). This was divided by five years to equal 1858 ha/year. One hundred percent of the volume is even-aged management.

The total annual harvested area is likely to decrease slightly as the timber supply is projected to decline 10 percent per decade. The percentage of even-aged management may also decrease as uneven-aged management is used to address non-timber resource values such as visual quality.

Table 2.2.5 Minimum harvestable ages by leading species and site class, Robson Valley TSA 1994

	Site:		
Species	**G**	**M**	**P**
Fdi	90	120	140
Pl	80	90	100
S	100	110	120

2.2.5 TIMBER SUPPLY DYNAMICS AND THE AAC

The 1994 TSR, upon which the current AAC determination was based, shows the allowable annual cut can be maintained for 10 years without causing a reduction in future harvest levels below the long-term level (see Figure 2.2.5). After 10 years the harvest declines at 10% each decade until the long term is reached in the sixth decade. The long-term harvest level, the potential maximum that can be harvested in perpetuity, is about 351 000 cubic metres per year, a 41% decline from the initial harvest level.

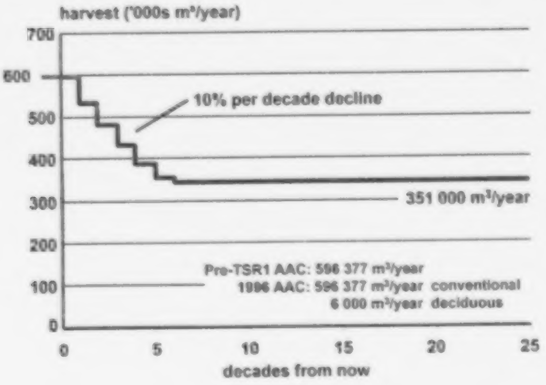

Figure 2.2.5 **Base harvest forecast, Robson Valley TSA.**

The steep decline from current harvesting levels to a much lower long term harvest level is characteristic of management units where the remaining mature timber is being rapidly depleted. Figure 2.2.6 overlays the forecast levels of total and harvestable growing stock on the base case, demonstrating that the timing of the reduction of the stock coincides with the fall down in harvest.

2.2.5.1 TRANSITION FROM NATURAL TO MANAGED STANDS

The transition of the harvest from old growth to predominantly second growth is also plotted on Figure 2.2.6. Note that this transition line is an estimate – this information was not reported from the TSR1 analysis. The transition curve helps identify the response frameworks for developing a silvicultural strategy - the end of the mid term and beginning of the long term is the point at which the harvest is predominantly dependent on managed stands. This point is approximately 130 years from now for the Robson Valley TSA. The short term is arbitrarily defined as the first 20 years.

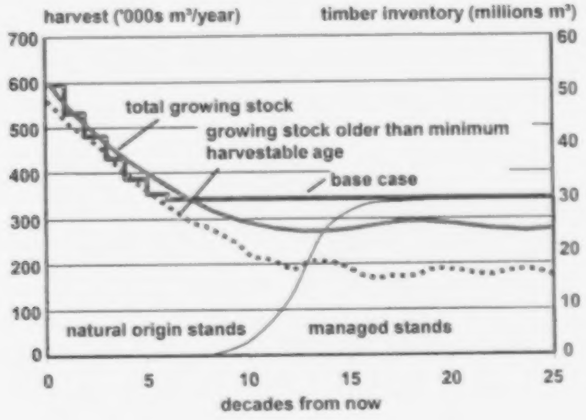

Figure 2.2.6 **Total and harvestable growing stock and harvest composition, Robson Valley TSA.**

2.2.5.2 SCARCITY OF HARVESTABLE TIMBER IN LATE MID-TERM

Figure 2.2.7 displays the age distribution of the timber harvesting land base currently, and in 50 and 100 years. Harvesting is concentrated in the age 310-320 (currently) for the first 50 years, and then in the 210-220 ages (currently) until 100 years. After 100 years (not shown) the harvest shifts to stands age 120+ years and is down to stands age 80+ years after 200 years.

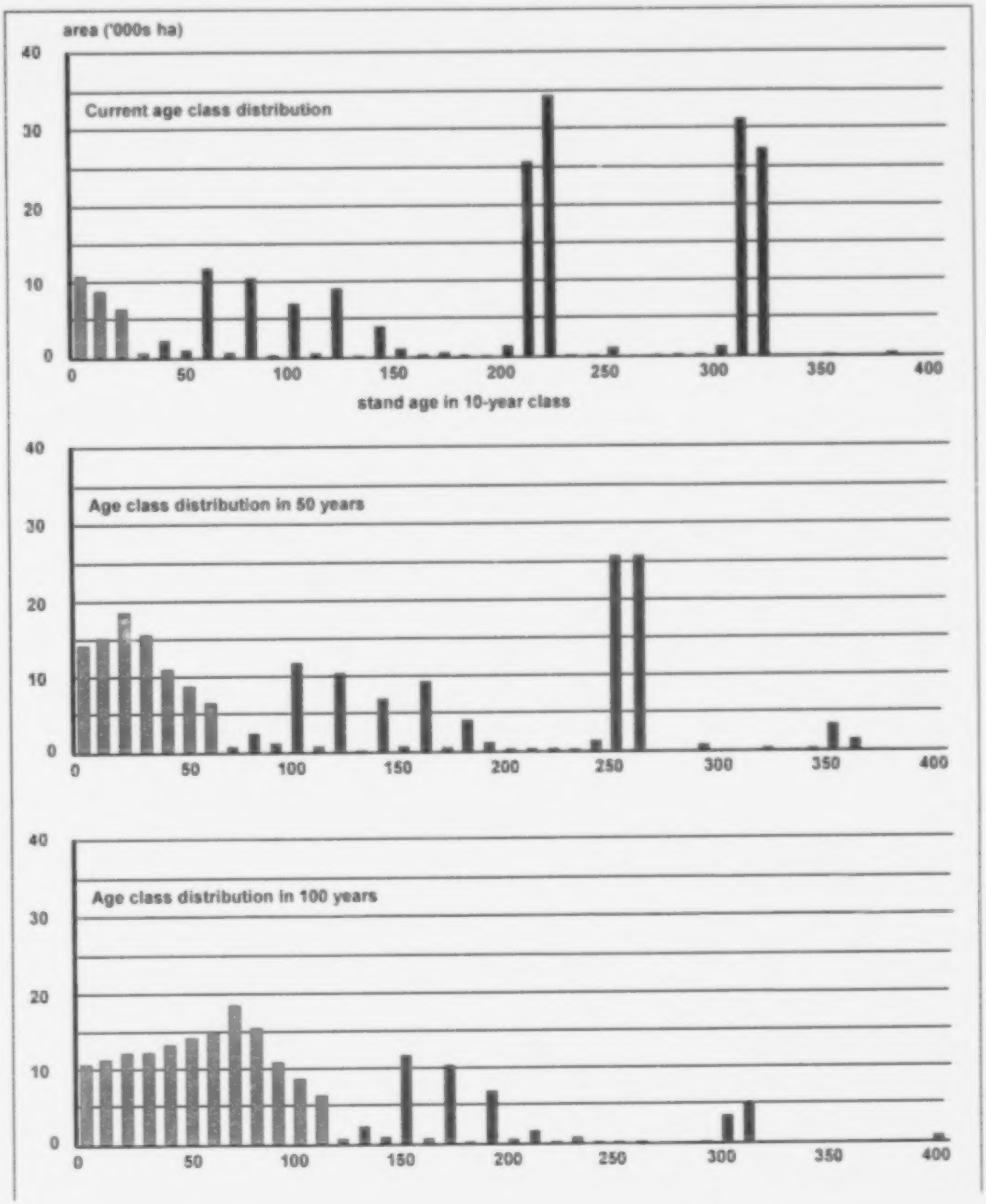

Figure 2.2.7 Stand age distribution projected over time – Robson Valley TSA.

Figure 2.2.7 illustrates that the shape of the timber supply curve is determined largely by the scarcity of mature timber – the main constraining mechanisms are smply the age class distribution and local stand growth rates.

2.2.5.3 RATIONING OF CURRENT MATURE TIMBER

Figure 2.2.8 demonstrates another major factor shaping timber supply – constraints on the rate of change of the harvest level. If the constraint of a maximum of 10% per decade decline is removed, the harvest level could be maintained for 7 decades before collapsing almost to zero in decade 10, and then recovering to the base case long term harvest level by decade 13.

Clearly, the lack of harvestable timber in decades 8-13 has been "filled in" by rationing the current available mature – timber which is currently age 210+ years. Timber rationing is the main objective of constraints on the rate of change of harvest levels. Note that under the base case constraints, any silvicultural activity that produces incremental volume in decades 8-13 releases some of this rationed timber, which in turn releases rationed timber earlier in the harvest queue. This process is a chain reaction allowing timber to substitute back up the falldown steps. Because TSR harvest flow rules will not allow the first decade cut to be increased above TSR if it must subsequently fall, the increment will probably accrue to the second decade. This is the Allowable Cut Effect, in the context of TSR rules.

This second mechanism shaping timber supply – constraints on the rate of change of the harvest level – also provides a means of capturing silvicultural benefits in the short term. Note that the efficacy of this effect is determined by the shape of the timber supply curve and hence is specific to the management unit.

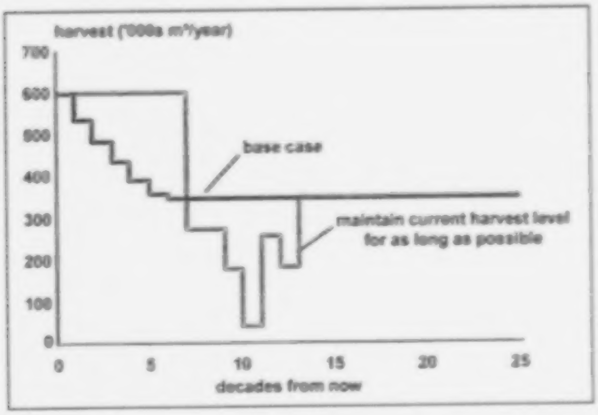

Figure 2.2.8 **Harvest forecast with current harvest maintained as long as possible, Robson Valley TSA.**

2.2.5.4 MINIMUM HARVEST AGES

Minimum harvest ages were set by District staff after review of volume per hectare requirements, culmination ages and field experience. Most minimum harvest ages are set at least 10 years before culmination. Minimum harvest ages might be reduced further through silviculture and the TSR sensitivity analysis Figure 2.2.9 gives us some idea of how much of a timber supply benefit is possible and when it might occur. In the short and early mid term, reducing minimum harvest ages has significant improvement is timber supply. This seems odd as our earlier examination of the forecasted age class distributions indicated that the harvest was supported mainly by stands age >200 years. However, its likely that sometime after decade 10, during the period of maximum scarcity before sufficient managed stands were available to support the cut, the model is harvesting stands at their minimum harvest age. The increase in available stands at this critical point (resulting from reducing minimum harvest age by 20 years) is substituted forward in the harvest queue, up the fall down staircase, drawn by the modelers desire to maintain the initial harvest level for as long as possible and yet still decline at a maximum rate of 10% per decade.

These effects are quantifiable: in the short term (second decade), reducing the minimum harvest age by 20 years produces a benefit of 60,000 m^3. This is based on a harvest rate of 1800 ha per year. So, a silvicultural treatment that reduces minimum harvest age by 20 years produces a benefit of (60 000/1800=) 33 m^3/ha, and a treatment that reduces minimum harvest age by 1 year produces a benefit of (33/20=) 1.65 m^3/ha in decade 2. Using similar logic, in the early mid term (decades 3-6), any treatment that reduces mha by 1 year produces a benefit of ((40 000/1800)/20 =) 1.1 m^3/ha treated.

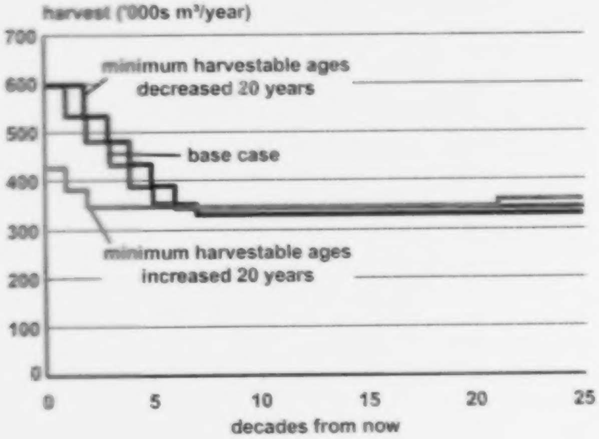

Figure 2.2.9 **Harvest forecast with minimum harvest ages changed by 20 years – Robson Valley TSA.**

Figure 2.2.9 also demonstrates that the harvest flow constraint mechanism for bringing benefits forward also works in reverse if there is a increase in scarcity at the critical period (pinch point) in supply. If minimum harvestable ages increase by 20 years, the period of scarcity is deepened and lengthened, and much more of the remaining mature timber must be held in order to sustain the cut at the long term harvest level. In this case , the short-term and early mid-term reduction in supply resulting from increased minimum harvest age is much larger in magnitude than the short-term and early mid-term increases that would occur if the minimum harvest ages were decreased.

Note that in the TSR sensitivity analysis, the change in harvest ages is applied to all stands across the 250 year modelling horizon, while we would be applying silviculture treatments to specific inventory targets and might expect larger benefits.

2.2.5.5 GREEN-UP

The TSR sensitivity analysis for green-up (Figure 2.2.10) provides us with similar results. A 10 year decrease in green-up results in benefits across the entire planing horizon, but the short-term and early mid-term benefits are much larger than the long term benefits. The same mechanism that was described for minimum harvest ages also applies here – at the time of real physical shortage (decades 7-15), reduction of the green-up ages by 10 years frees up harvestable stands, and the benefits forward substitute back up the fall down staircase. The sensitivity coefficients can be calculated using the same logic as for minimum harvest ages. In the short term, reducing green-up age by 1 year produces 3.3 m3 per hectare treated; in the early mid term, the benefit is 2.2 m3 per hectare treated, and in the later mid term and long term, the benefit is 0.6 m3 per hectare treated. The assumptions for this and subsequent calculations can be found in the summary table at the end of this section.

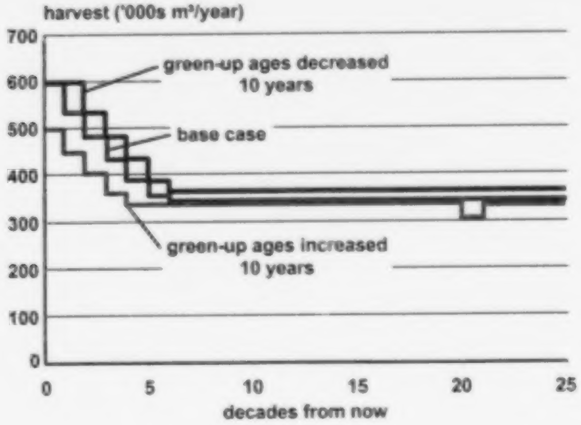

Figure 2.2.10 Harvest forecast with green-up ages changed by 10 years – Robson Valley TSA.

Increasing green-up age results in a large reduction in short and early mid-term timber supply. The reason for this is similar to that for increasing minimum harvest ages. That is, the increased green-up age causes the period of real physical scarcity to broaden and deepen, and more of the existing stock of mature timber must be rationed to maintain the harvest at the long term harvest level.

2.2.5.6 INCREASING STAND YIELDS

Increasing existing stand yields has a substantial effect on short- and mid-term timber supply (Figure 2.2.11). Again, the late mid term scarcity and forward substitution effect allows a disproportionate benefit to be realized in the earlier decades. Increasing regenerated volumes has no effect in the short or mid-term. The sensitivity coefficients for these two effects are included in the summary table at the end of this section.

2.2.5.7 INCREASING THE TIMBER HARVESTING LAND BASE

Various silvicultural activities can be interpreted as bringing land into the timber harvesting land base and so the TSR sensitivity analyses of the effect of increasing the timber harvesting land base (Figure 2.2.12) will provide information on the magnitude and timing of the benefits. Increasing the timber harvesting land base increases timber supply across the whole planning horizon and the sensitivity coefficients for this effect is included in the summary table at the end of this section.

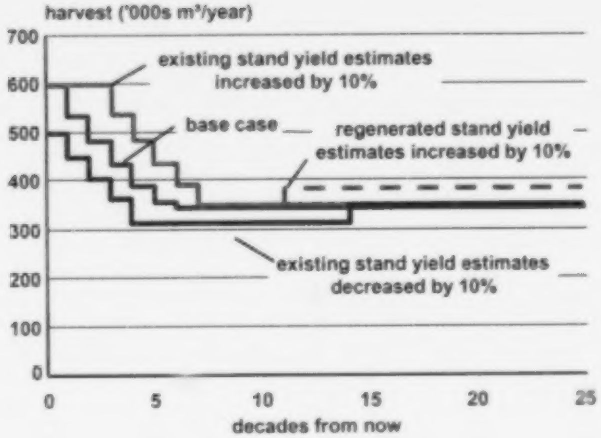

Figure 2.2.11 **Harvest forecasts with existing and regenerated stand yield estimates increased by 10%**

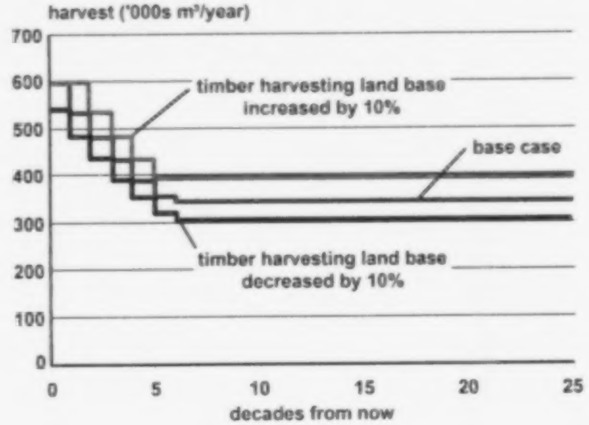

Figure 2.2.12 **Harvest forecasts with the area of the timber harvesting land base increased and decreased by 10%.**

2.2.6 TIMBER SUPPLY DYNAMICS - SUMMARY

The main constraint on timber supply in the Robson Valley TSA is the physical scarcity of harvestable timber in the late mid-term. This scarcity requires that the substantial volumes of existing mature timber from unmanaged stands be rationed until managed stands are ready for harvest. The rationing mechanism (TSR harvest flow constraints) can also be used to convey back to the short- and early mid-term the future timber supply benefits resulting from manipulating forest-level parameters. Silvicultural practices that adjust green-up ages, minimum harvest ages, stand yields, and the extent of timber harvesting land base will have significant effect on timber supply and those effects are quantified as sensitivity coefficients in Table 2.2.6.

However, the same mechanism works in reverse if timber supply is reduced at the period of physical scarcity. Currently mature and available timber must be pulled backward in the harvest queue (rationed) to offset the reduction in available supply in the critical period. Short- and mid-term reductions due to increases in minimum harvest ages and green-up ages are disproportionately large relative to the timber supply benefits accruing to those time periods from reducing minimum harvest ages and green-up ages.

Table 2.2.6 Sensitivity coefficients relating forest-level factors to timber supply.

Forest Level Factors	Term	Gross Benefit (m3/ha)	Area Harvested (ha)	Change (years)	Sensitivity Coefficient[1]
Greenup Age (years)	Short	60,000	1800	-10	3.3
	Mid	40,000	1800	-10	2.2
	Long	10,000	1800	-10	0.6
Minimum Harvest Age (years)	Short	60,000	1800	-20	1.7
	Mid	40,000	1800	-20	1.1
THLB age< greenup (%)	Short	60,000	1800	-5	6.7
	Mid	40,000	1800	-5	4.4
	Long	10,000	1800	-5	1.1
existing stand yields (%)	Short	70,000	1800	10	3.9
	Mid	82,000	1800	10	4.6
regenerated stand yields (%)	Long	42,000	1800	10	2.3
timber harvesting land base (%)	Short	60,000	1800	10	3.3
	Mid	47,000	1800	10	2.6
	Long	50,000	1800	10	2.8
[1] m^3/ha treated per unit reduction					

2.2.7 KEY ISSUES AND POTENTIAL SILVICULTURAL STRATEGIES

This section identifies the key Sustainable Harvest issues facing the TSA, as well as potential silvicultural strategies considered suitable to address them. Of those resource supply issues described in Section 2.2.2, three were considered key by stakeholders:

- Severe decline in short, medium and long-term timber supply.
- White pine blister rust losses
- Potentially declining local timber quality

Potential silvicultural strategies are those silvicultural interventions having potential to either maintain or increase future timber supply at the TSA level. Those strategies considered feasible and desireable by Robson Valley stakeholders are listed in Table 2.2.7. This set of strategies must be considered provisional at this time; they must be further evaluated during Type II Silvicultural Analyses currently underway. Local technical expertise, current policies and present uncertainties surrounding some strategies are reflected in SH investment recommendations.

The identity of each silvicultural strategy in Table 2.2.7 conveys the expected time of timber supply response (S-short term, M-medium term, and L-long term), or whether the strategy is timber quality oriented (Q), or designed to address forest health (FH) issues.

Figure 2.2.13 illustrates the timber supply responses of the strategies identified in Table 2.2.7. Strategy S3, reducing the minimum harvestable age by spacing younger existing stands, targets the pinch point in timber supply identified in section 2.4.3. Short term timber supply is sensitive to reductions in minimum harvestable age due to the forward substitution. Attaining green-up at an earlier age (S4) releases adjacent timber for harvesting in the short term. Maintaining the timber harvesting land base by meeting the backlog reforestation assumptions of the TSR (L1) benefits timber supply in the long term, as does increasing the yield of regenerated stands.

Table 2.2.7 Potential silvicultural strategies, tactics, target stands and stakeholder priority for mitigating key Robson Valley TSA resource supply issues.

Issue	Silvicultural Strategy	Silvicultural Tactics	Target Stands	Rank
Declining short, medium and long term timber supply	**S3** Reduce minimum harvestable ages by 10 years	precommercial thinning (juvenile spacing)	pine existing stands, ages 15-30, >3000 sph	5
		precommercial thinning	spruce existing stands, ages 15-30, >3000 sph	6
	L3 Increase the volume of regenerated stands by 20%	repeat fertilization, 15year cycle	regen, all; Pl, Fd, sites: (lower 1/4G, M, upper 1/4P)	nr
		repeat fertilization, 15year cycle	Pl, Fd, sites: (lower 1/4G, M, upper 1/4P), East Canoe, <2000 sph	7
	L1 Maintain the timber harvesting land base	survey	pre-87 backlog SR impeded	1
		brush		2
		site prep	pre-87 backlog	3
		plant		3
Pest losses to juvenile white pine	**FH1** Prune to reduce risk of infection	Infected branch pruning	Fdi, Pl, Pw stands (Pw priority; Fdi and Pl mixed in)	4
Declining timber quality	**Q1** Clearwood prujning	Branch pruning	Fdi, Pl	8

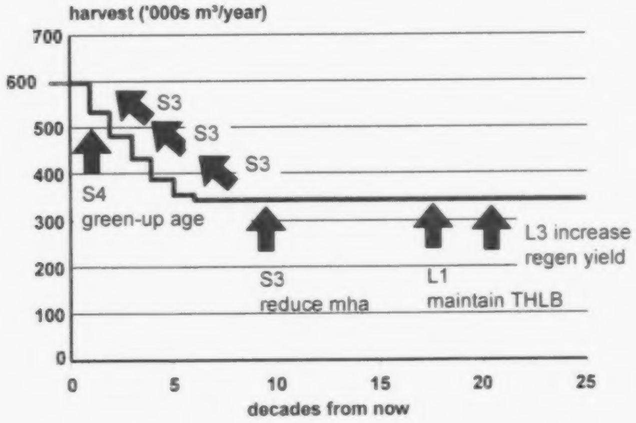

Figure 2.2.13. Location of timber supply effects of the selected strategies.

Table 2.2.8 Silviculture tactics, the strategies they implement, their impacts on TSA objectives, and their overall TSA priorities.

Issue	Silvicultural Strategy	Silvicultural Tactics	Target Stands	Opportunity Area (Ha/Yr)	Timber Supply Effects				Habitat	Jobs Days/ha	Cost $/ha[1]
					Short	Medium	Long	Quality			
Declining timber supply	Maintain the timber harvesting land base	Surveys - general		1355						0.1	23
		Survey - prescription	SR impeded backlog	4000						0.1	20
		Site prep backlog	NSR	50		M	M		-	1.0	900
		Plant backlog	NSR	50		M	M		-	1.3	800
	Reduce green-up ages by 10 years	Brush impeded	SR	400		M	M		-	2.0	900
	Reduce minimum harvestable ages by 10 years	Precommercial thin	Pl existing stands, ages 15-30, >3000 sph	100	+ +	+	-		+ +	3.0	1200
			Sx existing stands, ages 15-30, >3000 sph	100	+ +	+	-		+	3.0	1200
	Increase the volume of regenerated stands by 20%	Fertilize, repeat 15 year cylce	Pl, Fd, sites: (lower 1/4G, M, upper 1/4P), East Canoe, <2000 sph	400 (5 years only)	+ +	+			+/-	0.1	250
			Pl, Fd, sites: (lower 1/4G, M, upper 1/4P), <2000 sph	0 (up to 1 100 in short term)		+	+		+/-	0.1	250
White pine losses	Prune to reduce risk of infection	Prune	Fdi, Pl, Pw stands (Pw priority; Fdi and Pl mixed)	75	+ +	+		+		1.0	300
Declining timber quality	Clearwood prujning		Fdi, Pl	200				+		4.0	1200

+, - indicates, respectively, a positive or negative impact on the indicated objective.

+/- indicates that the activity could have a positive or negative effect, depending on its circumstances of application

M necessary to maintain the TSR; TSR assumption

nr not ranked

Tactic 1, general surveys, is estimated to be three times the annual total program level.

Tactic 3, site preparation of backlog NSR, will not begin until 2001.

Tactic 8, fertilization of East Canoe sites: the opportunity area of 400 ha/year will be exhausted in 5 years.

Tactic 8, East Canoe sites consist of old beetle salvage

Tactic 9, fertilization: there is no opportunity in the next five years to implement this regime but the workshop determined that the program could reach a level
year in the long run.

2.2.7.1 TACTICAL PRIORITIES

The priority rankings of Table 2.2.8 represent a balance between the TSA strategic concerns and the silvicultural opportunities available on the TSA in the next 5 years.

After surveys, which are necessary precursors to the remainder of the program, the highest ranked tactics are the silvicultural treatments of backlog NSR, which implement strategy L1 (maintenance of the timber harvesting land base as represented in the TSR).

The next tactical priority was pruning of the Pw components of mixed Fdi, Pl, Pw stands, which implements the forest health strategy FH1, pruning to reduce risk of infection, and strategy L3, increasing regenerated stand yields.

Note that strategy L3 actually provides multiple forest benefits. Application of this regime to young existing stands is expected to reduce the minimum harvestable ages of timber available for harvest (designate as S3 in Figure 2.2.13) and increase the supply of harvestable timber at a point of scarcity (pinch point) in the late mid-term. The timber supply benefits are expected to accrue to the short term. The fertilization component of this regime will accelerate green-up (designated S4 in Figure 2.2.13), also increasing timber supply in the short term.

Applied to both current and future stands, fertilization will increase long-term timber supply by increasing stand yields, designated L3 in the Figure.

The next tactical priority was precommercial thinning existing Pl and Sx stands, to implement S3, the strategy of reducing minimum harvestable age. The last priority is Pruning for clear wood values Q1

2.2.7.2 RECOMMENDED KNOWLEDGE STRATEGIES

There are many related TSA silvicultural issues not directly addressable via silvicultural practices. Many of these require investigation and further study. Table 2.2.9 identifies, and ranks the importance of 10 Sustainable Harvest knowledge gap issues.

Table 2.2.9 Silviculture issues requiring study.

Sustainable Harvest Knowledge Gap Issue	Priority
Confirm or refine site productivity estimates for the TSA.	1
Develop a growth and yield monitoring strategy (including the effects of leader weevil and root collar weevil).	2
Review the green-up ages used in the TSR and clarify how they were derived. Confirmation of these green-up ages may require a sampling project.	3
Confirm or refine the OAF1 estimates of the TSR with OAF1 surveys	4
Establish spruce fertilization trials, emphasizing both late rotation and early fertilization regimes.	5
Support and participate in the caribou high trials.	6
Post TSR2, investigate opportunities on non-merch and low sites.	7
Evaluate the need and opportunity for Pw pruning.	7
Establish fertilization trials in Pl age 30-50	8
Establish spruce pruning trials and determine if timing is a factor in success or failure.	9

2.3 MACKENZIE TSA SUSTAINABLE HARVEST ISSUES AND SILVICULTURAL STRATEGY

This section describes the key sustainable harvest issues in the Mackenzie TSA, and defines a provisional silvicultural strategy to address them. The following strategic analysis is based on a recently completed Type I Silvicultural Analysis, but requires further, detailed forest analysis and modelling in the Type II analysis. This step is currently underway, and the results will be incorporated into the 2002 Sustainable Harvest RMP. In the meantime, this provisional strategy is reflected in the proposed, 5 year Sustainable Harvest Plan for the Mackenzie Forest District (Section 2.8).

2.3.1 THE RESOURCE LAND-BASE

The Mackenzie TSA covers 6 130 604 hectares, of which 1 160 581 (18.9%) is considered to be in the timber harvesting land base.

The site class classification for TSR 1 was: 45% medium, 37% poor, 1% low, and 18 % good site. A recent re-inventory has shifted the site classification used for TRS2.

Figure 2.3.1 shows the proportion of area of each species that is either younger or older than the minimum harvestable age. Approximately 77% of the stands in the timber harvesting land base are at or above the minimum harvestable age.

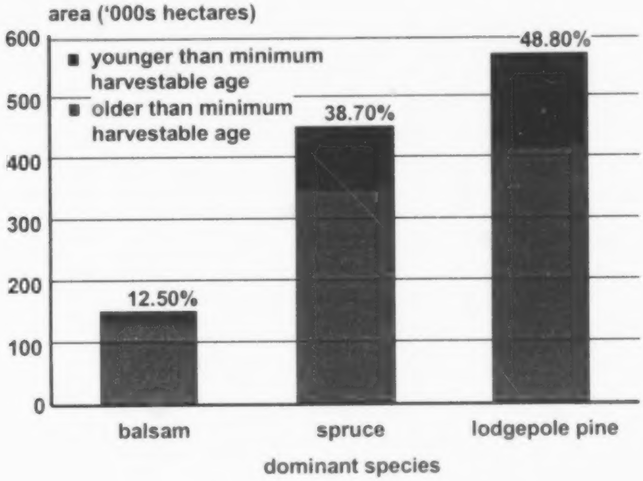

Figure 2.3.1 Area by dominant species, Mackenzie TSA 1995.

The Watersheds BC database classifies forests stands by age and disturbance, and is useful for identifying habitat issues. On Figure2.3.2, old forests are defined as age >140 years, young forests are age <140 years, recently logged forests are age ≤ 20 years, selectively logged forests are forests selectively logged during the last 20 years, and burned forests are forests burned during the last 20 years. The maps used to create this database were based on data from 1992-1993. Therefore any areas burned or logged in the last 6 or 7 years are not reflected by this data.

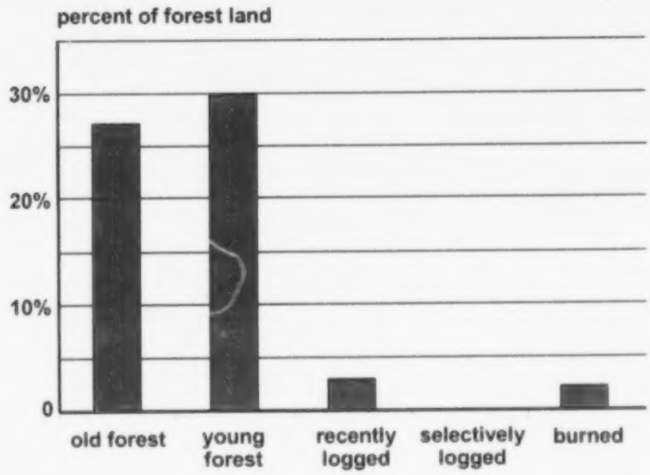

Figure 2.3.2 Watersheds BC forest classification of the timber harvesting land base, Mackenzie TSA 1995.

2.3.2 RESOURCE SUPPLY ISSUES

2.3.2.1 TIMBER SUPPLY – VOLUME

Uncertainty in the status of the pre-87 logging and fire disturbed land base -

The latest inventory estimates of pre-'87 backlog area in the TSA is 395 000 ha, or 13% of the productive forest land base (THLB).[8] Of this total, 120 000 ha consists of sites disturbed by logging activity, and 275 000 ha are of wildfire origin. TSR 1 analyses assumed at total pre-'87 NSR inventory of 18 677 ha, and predicated timber supply on restocking this area by 2005. The remainder of the backlog area (376 333 ha) were assumed in the TSR 1 analysis to be contributing to the timber supply at a fully stocked, unimpeded rate. In reality, the actual silvicultural performance of these pre-'87 stands may fall short of the TSR 1 assumptions. For example estimates from a backlog reclassification project (1995-1998 aerial photo assessments) suggests the following:

Up to 10 610 ha of the pre-'87 NSR stands may be stocked, but at minimum standards.

Site preparation/planting/fill planting accomplishments since 1995 have restored only 2 220 ha to a fully stocked level, but require follow-up intervention to meet acceptable production, and legally binding silvicultural obligations.

A further 4613 ha of the remaining NSR inventory (comprising 3067 ha of treatable pre'82 on good and medium sites, and 1546 ha of 1982-1987 backlog on good, medium and poor sites) requires re-stocking in order to comply with provincial backlog management policy

many of the stands in the pre'87 backlog inventory are impeded by broadleaf vegetation, and thereby may be producing coniferous timber at a rate lower than assumed. Current estimates from the Mackenzie District backlog database indicate that at up to 32 000 ha of the logging origin pre-'87 land base requires some form of impeded stand release from broadleaf competition. In contrast to this large treatment potential treatment opportunity, the actual impeded stand treatment achievement since 1995 has been 10 307 ha, or approximately 2 000 ha/year.

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[8] This would account for up to 34% of the THLB under an assumption that all fire origin pre-'87 stands lie within the THLB – a possibility which has neither been confirmed nor explored.

Uncertainty of backlog status in the TSA confounds strategic planning. For example, 63 000 ha of the backlog inventory has yet to receive any form of stocking survey to confirm production status, and an additional 70 000 ha, classified as a potentially free growing (based on aerial photo interpretation) requires a confirmatory free growing survey. Of the pre-'87 fire origin land base, approximately 253 800 ha is of unknown timber production status.

Site Productivity Potential - As indicated in the 1999 Mackenzie RMP, the site index of stands in the TSA may be 20% higher than existing stands. This would mean for a medium site Pl stand an increase in SI from about 16 to about 19. A Pl stand, SI 16, planted to 1600 sph culminates at age 85 and yields 248 m3 per ha at 12.5 cm utilization (standard TIPSY OAFs). At SI 19, this same stand culminates at age 72 and yields 286 m3 per ha. The MAI increases by 36%, from 2.92 (SI16) to 3.97 m3 per hectare per year (SI 19). However, this enormous potential to enhance timber supply is predicated on adequate broadleaf vegetation control. Actual volume production will also vary depending on the level of stocking.

Impact of Spruce, Pine and Balsam Beetles and Defoliators - TSR 1 assumed an annual rate of loss from insects, fire and windthrow at 290 000 m^3/year, of which up to 98 000 m^3/year would be salvaged. Since 1995, the actual rate of loss may have exceeded this assumption. Timber supply in the Mackenzie TSA is very sensitive to uncertainty regarding timber volumes in existing mature stands. For example, a 10% reduction in mature stand volumes has been shown to reduce the current harvest level by 20% nearly 10 years earlier than projected in the 1995 timber supply forecast. Uncertainty regarding the infestation level, pest population dynamics, or salvage and reforestation capability constitutes a serious issue for timber resource management.

Managed Stand Pathogens and Pests – Regenerated lodgepole pine offer enormous timber production potential in the TSA. Unfortunately, the species also suffers from a plethora of juvenile stand pests, the most serious of which are lethal infections of any of three species of stem rusts. These rust fungi can substantially reduce the volume production of plantations as well as pre-commercially thinned stands of natural origin. Improved silvicultural tactics are required to deal with this serious timber production problem.

Silvicultural Tactics for Special Sites - Local tactical design and innovation is required to address special timber management problems. Most stand interventions are conventional applications of reforestation and stand tending treatments developed for average stand and site conditions. A considerable area of current and pre-'87 stands in the TSA occupy sites with special resource values, or consist of structural characteristics for which conventional silvicultural practices are ineffective, or inefficient. Development of prototype prescriptions, their evaluation and comparison with conventional treatments, and subsequent technology transfer to operations is required.

Stand Intervention Costs - The cost of most conventional stand intervention tactics has steadily increased since 1990 in the Mackenzie TSA. It is not known whether this is a factor specific to Mackenzie, however unit costs for similar treatments in other regions and districts are often lower. In the face of rising unit costs (over $1000 for manual brushing and pre-commercial thinning, and $500 for aerial, chemical brushing) an analysis of cost versus effectiveness is warranted. This will encourage selection, or development of tactics which are socially, biologically and economically justifiable.

2.3.2.2 TIMBER SUPPLY – QUALITY

From a timber resource quality perspective it is not possible to formulate a timber quality strategy at this time. Forecasts of future timber market conditions are necessary in order to evaluate the economic efficiency of various silvicultural activities. TSR 1 was silent on the topic of timber quality, and most statements of forest level objectives are too vague, or inadequate to develop a timber quality strategy at this time. For this reason, no attempt has been made to identify potential timber quality issues in the Mackenzie TSA.

2.3.2.3 HABITAT SUPPLY

Caribou – The local LRMP caribou management strategy includes the following statement:

> "Encourage use of reforestation and stand tending practices that enhance terrestial lichen retention and recovery on sites that are potential forested winter habitat (for caribou)."

There are two objectives: 1) to enhance the creation of suitable microsites for lichen establishment after logging on dry sites and 2) to enhance the dispersal of the preferred species into these areas. The success of these measures in providing caribou habitat at an earlier stand age might also depend on the forest canopy providing suitable cover at an earlier age but there is some indication locally that young pine stands can do that. The stand tending strategy is to retard the succession of lichen cover on the forest floor to moss cover on some of the more mesic sites, thus retaining the value of these stands as caribou habitat for a longer period prior to harvest.

The highest lichen loadings found by UNBC researcher Darwin Coxson were in sites that were logged during the winter about 20 years ago. This suggests that winter logging in prime areas would benefit caribou. In the short term the goal would be to retain lichens by winter logging and thinning or creating small opening in caribou range. Peak lichen abundance occurs about 90 – 100 years post logging. About 150 years post logging moss mats begin replacing, or overgrowing the lichens. In the long term the re-introduction of fire would benefit caribou.

Grizzly Bear – The manipulation of stocking densities on prime valley bottom grizzly bear habitat sites is desirable to try to avoid the dense spruce canopy that usually occurs in the mid-seral stage. The problem is not immediate, but is anticipated 30-40 years after logging, persisting to approx. age 100-120 in this area.

Deciduous component – There is concern that a combination of better fire suppression, prompt reforestation of recent burns with conifers, and natural succession of deciduous stands to conifer will, over time result in the elimination of deciduous dominant stands. Deciduous dominant stands often provide habitat components that are unavailable in conifer stands in this area.

Moose - The Peace-Williston Compensation Program is considering some trials of a proposed manual brushing technique that may achieve conifer release while continuing to provide moose browse for a longer period of time than the standard brushing methods. If the trials are successful these techniques could be very useful on good upland moose winter habitat.

2.3.3 SILVICULTURAL PRACTICES

2.3.3.1 SILVICULTURAL HISTORY

Table 2.3.1 records backlog (pre-1987 openings) silviculture for the TSA. Only silvicultural activities taking place after 1985 are shown. Table 2.3.2 records current (post 1987 openings) silviculture.

2.3.3.2 BACKLOG SILVICULTURE

Backlog silvicultural treatments have been a priority sinced 1995 when an FRBC funded program was instituted in the TSA. It is essential that adequate planning support is provided for this critically important program. Both tactical and operational planning are required to ensure that budget resources match program needs, and that silvicultural investments reflect the best tactics and most cost efficient investments.

At the present time, there is little tactical planning for backlog silviculture in the TSA, other than experience and anecdotal evidence concerning the efficacy of various conventional stand intervention tactics. Until reliable efficacy information is available, no biological differences between treatments in similar stands can be assumed. It is recommended, therefore, that efficacy monitoring of all conventional tactics be undertaken to guide the selection of the most cost effective treatment options.

Choice of tactic is often determined by non-timber values, such as proximity to water bodies, terrestrial habitat or viewscape features and other special resource values. Conventional backlog stand interventions are often unsuitable on many of these sites as well as in stands with unique structural characteristics. It will be necessary to develop special silvicultural interventions to deal with the following situations:

- Riparian management zone constraints.
- Riparian reserve zone constraints.
- Structurally complex stands (multi-layer, multi-species).
- Developmentally advanced pre-'87 stands.
- Habitat feature preservation/preservation requirements.
- Recreational value constraints.
- Special timber value constraints.

Innovative tactical planning will require the development and evaluation of prototype treatment prescriptions, and establishment of pilot demonstration areas to facilitate technology transfer to operational staff.

An operational planning system was developed for the Mackenzie Backlog Program during previous years, which provided an annual operational plan for Forest Renewal implementing partners. It is essential that operational planning for this program continue during to ensure the effectiveness and efficiency of investments, and availability of budget resources. The four key operational planning functions required are:

- database and map maintenance and update
- Annual operating plan preparation
- surveys/data collection (free-growing, survival, stocking, stand tending)
- Pesticide Management Plan coordination

Table 2.3.1 Backlog silviculture history 1986-98 , Mackenzie TSA.

Year	Backlog Site Preparation (ha)	Backlog Planting (ha)	Backlog Brushing (ha)	Backlog Spacing (Pre-Commercial Thin) (ha)	Backlog Pruning (ha)	Backlog Fertilization (ha)
1986	18746.7	8434.9	885.9	245		
1987	9692.9	9440.9	1712.9	766		739
1988	7539.9	10460.4	946	851		580
1989	4001.4	8636	2044.5	1135.5	21	581
1990	1111.8	4265.8	1411.9	491.1		
1991	1317.9	1972.6	2352.8	920.4		
1992	1248.8	1269.4	1602.3	344.5		
1993	347	1764.7	1888.2	14		
1994	142.9	389.6	1185.6	565.3		
1995	276.4	26	1328.6	92.3		
1996	4	307.8	2496.2	463		
1997		3.6	2762.8	844.5		
1998		35.7				
Total	**44429.7**	**46971.7**	**20653.4**	**6732.6**	**46971.7**	**1900**

Table 2.3.2 Current silviculture history 1988-99, Mackenzie TSA.

Year	Site Preparation (ha)	Planting (ha)	Brushing (ha)
1988	863.2	56.4	
1989	5276.9	1562.1	
1990	5782.9	6977	
1991	6179.3	6154.8	
1992	5504.9	6247.6	
1993	7004.2	9632.2	240.2
1994	3930.3	9911	
1995	2602	10086.8	251.1
1996	610.5	8010.5	1906.1
1997	102.8	3039.6	1240.1
1998	93.8	2578	689.1
1999	21.9	474.8	
Total	**37972.7**	**64730.8**	**4326.6**

2.3.3.3 PRECOMMERCIAL THINNING

The area precommercially thinned has fluctuated annually through 1990's. During recent years production has averaged approximately 500 hectares per year. The maximum program level was about 1 100 hectares per year in 1990. At the end of fiscal 98/99, there was a total of approximately 7 600 hectares of precommercially thinned stands in the TSA (about 0.7% of THLB).

An assumption was made in the previous timber supply review that little incremental silviculture had been practised in the Mackenzie TSA. This is clearly not the case. In excess of 1 million dollars has been invested in pre-commercial thinning of lodgepole pine stands alone between 1980 and the end of 2000.

Despite this large total investment over nearly 20 years, little in the way of biological monitoring of results has been undertaken. More scrutiny of treatment results is necessary to guide local precommercial thinning regimes.

2.3.3.4 TREE IMPROVEMENT

The tree improvement program is likely to significantly improve stand yields over time, in the order of 5% for lodgepole pine and 15% for spruce. Table 2.3.3 lists the most recent volume gain estimates for improved seed.

Table 2.3.3 Forecast gain in volume from improved seed for the Mackenzie TSA.

Species	Seed Zone	Elevation (m)	% Gain – Improved Seed		
			98-99	90-00	2007-08
Pli	CP Low	<1000	6	3	7
Sx	PG Low	<1200	14	15	17
Sx	PG High	<1200	17	17	16
Fdi	PG Low	<1200	19	19	19

2.3.4 TSR1 MANAGEMENT ASSUMPTIONS

In addition to the inventory, or current state of the forest, assumptions about how it will be managed as essential for determining a silviculture strategy.

2.3.4.1 INVENTORY PROFILE

The inventory profile (species composition) of the timber harvesting land base is expected to change over time. After harvest, stands with a predominance of balsam are planned for regeneration to spruce. Under this management regime, the forest would consist about equally of lodgepole pine and spruce dominated stands.

2.3.4.2 MANAGEMENT ZONES AND FOREST COVER REQUIREMENTS

The TSR management zones and their associated forest cover requirements are listed in Table 2.3.4. The requirements are applied by: a maximum of 33% of the area in a zone may be younger than the specified green-up age.

Table 2.3.4 Management zones and forest cover requirements.

Zone	Green-up age (years)	Maximum per cent area younger than green-up age	Old-age forest (years)	Minimum per cent area older than 150 years
Wildlife/watershed	16	21		
Wildlife (old-age 1)	18	33	150	25
Wildlife (old-age 2)	15	33	150	25
Integrated resource management	17	33		
Retention VQO	21	3		
Partial Retention VQO	20	11		
Modification VQO	20	27		

Source: Derived from TSR Mackenzie TSA Timber Supply Analysis 1995, p75.

Note that this system of management zones and forest cover requirements implemented in TSR 1 is no longer current practice and has been replaced with patch size and real stage targets.

2.3.4.3 MINIMUM HARVESTABLE AGE

For the Mackenzie TSR1 analysis, minimum harvestable ages were defined as the age at which 95% of the maximum average growth rate is reached. Table 2.3.5 lists the minimum harvestable ages for natural and managed stands by species and site class.

Table 2.3.5 Minimum harvestable ages by leading species and site class, Mackenzie TSA 1995

Species	Stand Origin	Min Age by Site Class (yrs)		
		G	M	P/L
B	Managed	65	90/120*	125/160*
B	Natural	60	70/80*	90/110*
S	Managed	70	95	130/170*
S	Natural	75	95	120/140
Pl	Managed	55	70	80
Pl	Natural	60	75	100

Source: Derived from TSR Mackenzie TSA Timber Supply Analysis 1995, p70. Minimum ages for stands regenerated from original whose ages were under/over 140 yrs of age – the reason for this distinction is not stated.

2.3.4.4 HARVESTING PRACTICES

The TSR1 analysis report indicates a first decade harvest level of about 11 000 hectares per year, rising to about 12 000 hectares per year in the second decade, after which it declines steadily to about 8 600 ha/yr in decade 9. The next peak in area harvested is in decade 16, corresponding with harvesting in primarily poor site managed stands.

It was estimated that approximately 10 059 hectares is harvested per year. This estimation was derived by adding the area for the first 50 years when the age class distribution is 50 years in the future. Virtually all area is clearcut followed by planting.

For the purposes of this strategy, a mid to long term average harvest area of 10 000 hectares per year is assumed. Of this, all is assumed to be clearcut.

2.3.5 TIMBER SUPPLY DYNAMICS AND THE AAC

The 1995 TSR, upon which the current AAC determination was based, shows that the pre-TSR AAC could be maintained for 3 decades before dropping at the rate of 5.25% per decade over the next 2 decades to a trough about 10.5% below the initial harvest level (Figure 2.3.3). After 10 decades, beginning 100 years from now, the harvest level rises about 5% to the long-term harvest level (LTHL).

The LTHL is only 4% below the long run sustained yield (LRSY). One-half of this (2%) is attributed to below optimum scheduling of the harvest related to the objective of maintaining a constant even flow. The other half is attributed to sub-optimal scheduling resulting from forest cover constraints. This forest cover constraint effect is among the lowest in the province, which are often in the 8-10% range elsewhere. It is consistent with the very small areas in highly constrained wildlife, watershed and scenic management zones.

The mid term shortfall is not a product of a shortage, but rather occurs be-cause the higher productivity associated with 2nd growth managed stands (54% higher MAI) allows harvest levels to increase once these stands become available

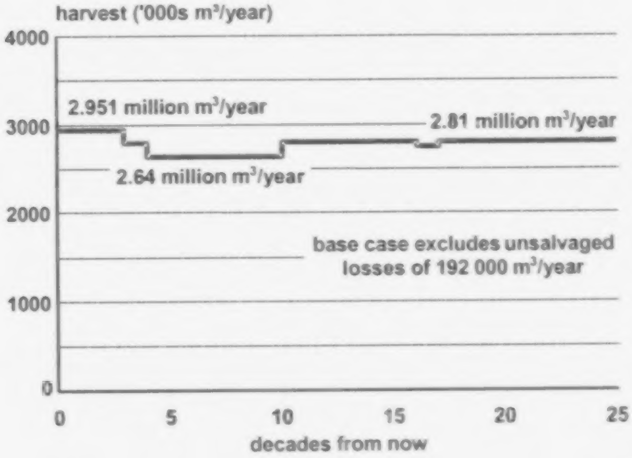


Figure 2.3.3 Base case harvest forecast, Mackenzie TSA, 1995.

2.3.5.1 HARVEST SCHEDULING AND GROWING STOCK AVAILABILITY

The available and merchantable growing stock (Figure 2.3.4) decline steeply until decade 10, coincidental with end of the mid-term trough. This pattern is indicative of rationing of natural mature stands until managed stands predominate the harvest.

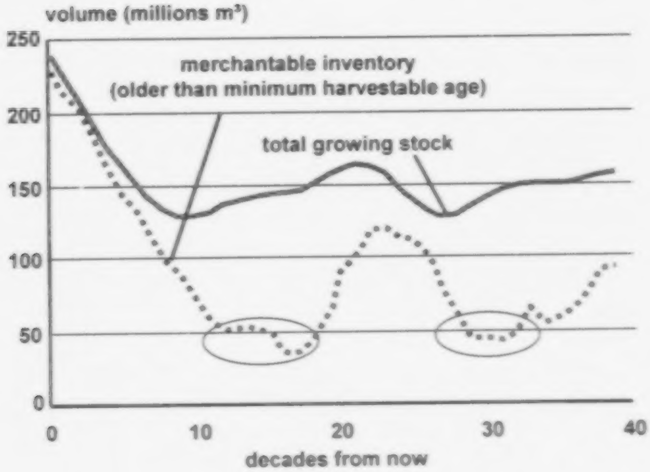


Figure 2.3.4 Total and harvestable growing stock, Mackenzie TSA, 1994

Growing stock is at a very low level during decades 11-17 and this low level repeats itself about every 150 year. This repetition reflects a 160 to 170 year cycle of growth and harvest of the less productive sites with older minimum harvest ages.

This cycle results a unique age class structure in the TSA 150 years from now (Figure 2.3.5). When the forecast reaches 150 years from now, there is a shortage of stands that are available for harvesting. Higher minimum ages for poorer site stands result in a build-up of slightly older stands.

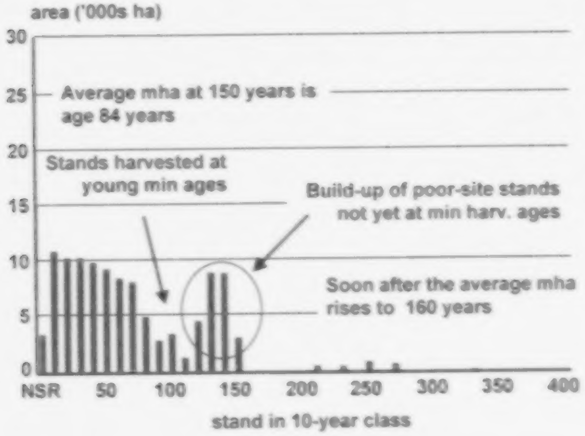


Figure 2.3.5 Age class composition 150 years from now.

The need to ration timber until the cut can be supported by managed stands has determined the shape of the supply curve. The main constraining mechanism is the age class structure of the TSA, the distribution of sites productivity in that age class distribution, and growth rates.

2.3.5.2 CHANGES TO THE TIMBER HARVESTING LAND BASE

Various silvicultural activities can be interpreted as bringing land into the timber harvesting land base and so the TSR sensitivity analyses of the effect of increasing the timber harvesting land base (Figure 2.3.6) will provide information on the magnitude and timing of the benefits. Increasing the timber harvesting land base increases timber supply across the whole planning horizon, while land base reductions result in a disproportionately large impact in the short and early mid-term.

Increases in the timber harvesting land base may be accomplished silviculturally by treating NC Br, deciduous, low site, and non-merchantable stands. Note that Figure 2.3.6 indicates that if a relatively small proportion of the area that was deducted in TSR1 becomes operable and/or merchantable, then the current AAC can be maintained indefinitely.

Decreases in the timber harvesting land base may occur due to newly protected areas or to management not meeting TSR assumptions with respect to stocking levels on pre-87 disturbed lands.

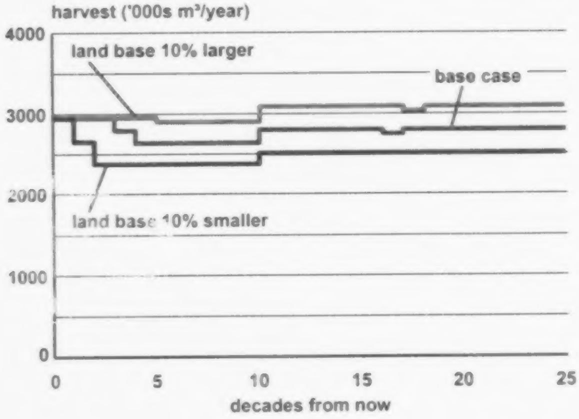


Figure 2.3.6 Harvest forecast with the timber harvesting land base +/- 10%, Mackenzie TSA, 1995.

2.3.5.3 CHANGING STAND VOLUMES

The TSR found that lowering existing stand volumes 10% causes the drop to the shortfall level to begin one decade earlier than in the base case (Figure 2.3.7). The shortfall is lowered further to about 19% below the current AAC.

Fortunately, a recent inventory audit has indicated inventory stand volume estimates to be acceptable, so the base case is not inordinately at risk from lower estimates.

However the TSA has a large fertilizable land base. Fertilization of suitable existing stands would increase their volumes and could contribute to increasing the timber supply in the short and mid terms. Given the size of the TSA, however, a very large fertilization program would be necessary in order to significantly affect the harvest forecast. The TSR defined managed stands include existing stands less than 10 years old and all future regenerated stands. Figure 2.3.8 shows the effects of increasing and decreasing managed stand volumes.

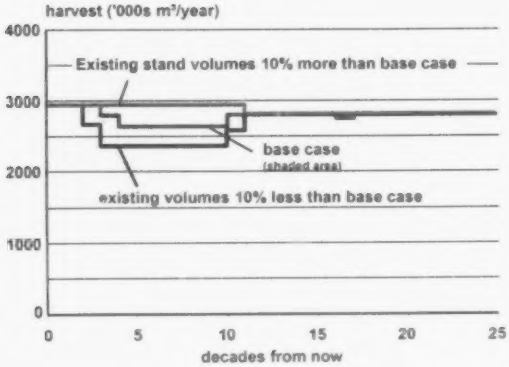


Figure 2.3.7 Harvest forecast with existing stand volumes +/- 10%, Mackenzie TSA, 1995.

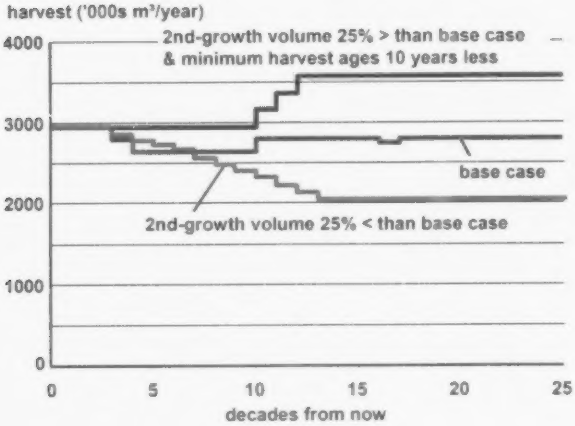


Figure 2.3.8 Harvest forecast with existing stand volumes +/- 25%, Mackenzie TSA, 1995.

Clearly, any silviculture treatment that enhances yields of current or future managed stands will have potential impacts in the mid- or long-term. The analysis report does not state when managed stands first become available for harvesting. Given that stands less than 10 years of age are considered managed and given a minimum harvest-able age of 55 years for good-site Pl, then its possible (although not likely) for the model to harvest the first managed stands only 45 years into the planning horizon.

2.3.5.4 MINIMUM HARVESTABLE AGES

Changing the minimum ages by only 10 years has a dramatic effect on the harvest forecast (Figure 2.3.9). Although not stated in the analysis report, this effect may be linked to the shortage of timber exceeding minimum harvest age in decades 12-17.

Lowering the min age 10 years makes timber immediately available to solve the timber supply problem. Conversely, raising the age 10 years makes the problem even worse. Depending upon the alternative, either less or more wood has to be held from the mid term to maintain the constant LTHL. What is not clear is whether the stands being held are existing or managed stands, or a combination of both. If the modelled harvest schedule is likely to occur in reality, then spacing should be focused in poor-site managed stands to reduce their minimum harvest ages. The benefits, in the form of increased harvest levels, could be realized as soon as 3 decades from now.

Growing forests to older ages generally improves their quality. However, Figure 2.3.9 demonstrates that delaying harvests for this purpose would lower harvest levels substantially in the short and mid-term.

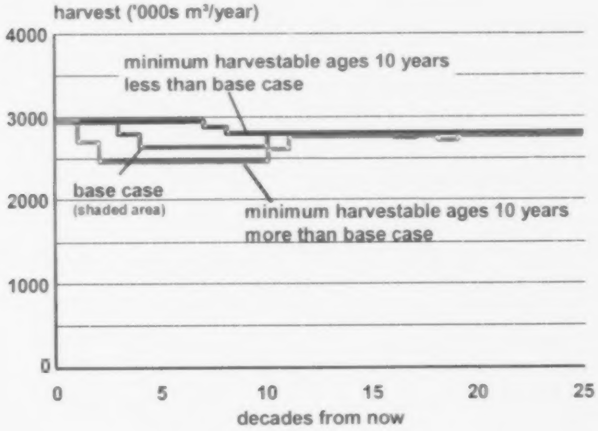


Figure 2.3.9 Harvest forecast with minimum harvestable ages +/- 10 years, Mackenzie TSA, 1995.

2.3.5.5 REGENERATION DELAY

The Mackenzie TSA is highly sensitive to changes in regeneration delay. Reducing the regeneration delay to 0 (a virtually impossible operational achievement) almost eliminates the mid term shortfall and significantly raises the LTHL (Figure 2.3.10).

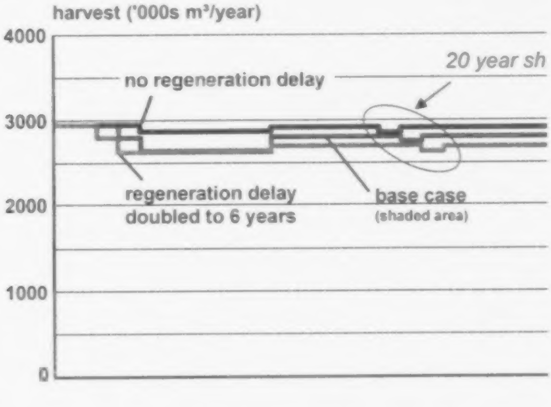


Figure 2.3.10 Harvest forecast with increases to the regeneration delay, Mackenzie TSA, 1995.

Conversely, doubling the delay to 6 years causes harvest levels to commence the drop to the mid term shortfall one decade earlier as well as significantly lowers the LTHL. This is a rather extraordinary response to a relatively small change. The fact that increasing or decreasing the delay causes a 20 year shift in the dip in LTHL indicates that there may be some interaction here with the shortage in timber in decades 12-17.

2.3.6 TIMBER SUPPLY DYNAMICS - SUMMARY

The main constraint on timber supply in the Mackenzie TSA is the relative scarcity of harvestable timber in the late mid-term, as the harvest becomes more dependent on managed stands. This scarcity requires that the substantial volumes of existing mature timber from unmanaged stands be rationed until managed stands are ready for harvest. The rationing mechanism (TSR harvest flow constraints) also conveys back to the short- and early mid-term the future timber supply benefits resulting from manipulating forest-level parameters. Silvicultural practices that adjust minimum harvest ages, stand yields, and the extent of timber harvesting land base will have significant effect on timber supply.

However, the same mechanism works in reverse if timber supply is reduced at the period of scarcity : currently mature and available timber must be pulled backward in the harvest queue (rationed) to offset the reduction in available supply in the critical period. Short- and mid-term reductions due to increases in minimum harvest ages and decreases in the timber harvesting land base are disproportionately large relative to the timber supply benefits accruing to those time periods from reducing minimum harvest ages and increasing the land base.

The TSR1 timber supply analysis was completed in 1995 and was almost five years out of date at the time of the workshop. In those five years new information about the TSA has been obtained, including a new base case harvest schedule developed for the LRMP. The TSR1 base case (Figure 2.3.3) was therefore reconsidered in light of this knowledge.

After considering potential upwards and downwards influences on the timber supply, however, it does not appear as if the base case harvest forecast needs to be revised.

Potential upward influences include the significant potential to increase the timber harvesting land base (through increasing the operable area and harvesting of stands currently considered non-merchantable) and higher site productivity estimates. Potential downward influences are the LRMP forecast which shows a significant mid-term harvest reduction; the protected areas strategy which may reduce the TSA land base by 7%; the very low levels of forest cover constraints in TSR1 (taken into account in the LRMP forecast); and concerns that managed stand volumes were over-estimated.

2.3.7 KEY ISSUES AND POTENTIAL SILVICULTURAL STRATEGIES

This section identifies the key Sustainable Harvest issues facing the TSA, as well as potential silvicultural strategies considered suitable to address them. Of those resource supply issues described in Section 2.3.2, four were considered key by management unit stakeholders:

- Declining timber supply in the short and medium term.
- Loss of productivity on backlog NSR and impeded sites.
- Potential loss of Caribou habitat through forest management and seral advancement.
- Potential loss of Grizzly bear habitat through forest management.
- Potentially declining timber quality.

Potential silvicultural strategies are those silvicultural interventions having potential to either maintain or increase future timber supply at the TSA level. Those strategies considered feasible and desireable by Mackenzie stakeholders are listed in Table 2.3.7. This set of strategies must be considered provisional at this time; they must be further evaluated during Type II Silvicultural

Analyses currently underway. Local technical expertise, current policies and present uncertainties surrounding some strategies are reflected in SH investment recommendations.

The ID of each strategy in Table 2.3.7 conveys the expected time of timber supply response (S-short term, M-medium term, and L-long term, or whether the strategy is timber quality oriented (Q), designed to address forest health (FH) or habitat (H) issues.

Figure 2.3.11 illustrates the timber supply responses of strategies selected in Table 2.3.7. Strategies S1, M1, M2 and L3 increase the existing and regenerating timber yields through fertilization. L1 ensures that the timber harvesting land base is not reduced in size by fill planting and brushing and weeding the understocked pre-87 logging-origin stands.

Table 2.3.7 Silviculture strategies, targets and activities identified in the workshop as feasible and desireable for the Mackenzie TSA.

Key Issues	Silvicultural Strategies	Silvicultural Tactics	Target Stands
Declining timber supply in the short and medium term	**S1** Increase volumes of existing stands	fertilize	Pl (25%G,M,25%P) late rotation -harvest in dec 2
	M1 Increase volumes of exisiting stands	fertilize	Pl (25%G,M,25%P) late rotation
	M2 Increase volumes of regenerating stands	fertilize: 4 applications at 15, 30, 45 and 60 years	Pl (25%G,M,25%P)
	L3 Increase volumes of regenerating stands	Improved seed	Pl, S
		fertilize: 4 applications at 15, 30, 45 and 60 years	
Loss of productivity on backlog sites	**L1** Maintain timber harvesting land base	fill plant	Understocked pre-87 logging-origin stands
		brush and weed	
Declining timber quality	**Q1** Ensure clear timber	Prune 2 lifts	Pl
Potential loss of Caribou habitat	**H1** Recruit/modify Pl lichen habit (caribou)	recruit	Pl burns
	H2 Recruit Pl lichen caribou habitat	survey	timber harvesting land base
Potential loss of Grizzly bear habitat	**H3** Grizzly Bear habitat	Precommercial thin	disturbed habitat

Note: (25%G,M,25%P) refers to the site range including the lower 25% of good sites, all medium sites, and the upper 25% of poor sites

The silviculture tactics required to implement the strategies identified in Table 2.3.7 are listed in Table 2.3.8. The table also provides an estimate of their impacts on TSA sustainable harvest objectives, the potential opportunity area (i.e., the area available for treatment for the next 5 years), the impacts on timber supply quantity and quality, and habitat effects for each treatment. The employment effects and costs are based on district and licensee records.

2.3.7.1 TACTICAL PRIORITIES

The rankings of Table 2.3.8 represent a balance between the participant's strategic concerns and the silvicultural opportunities available on the TSA in the next 5 years. Key tactical investments are as follows:

Silvicultural Surveys

Surveys and treatment prescription preparation are necessary precursors to the remainder of the program and were not ranked.

Free Growing Surveys

Free growing surveys of pre-87 disturbances, and field sampling were ranked as priority 1, as were fill-planting and brush/weeding of understocked pre-87 logging-origin stands. All of these activities implement strategy L1, the maintenance of the timber harvesting land base as represented in the TSR.

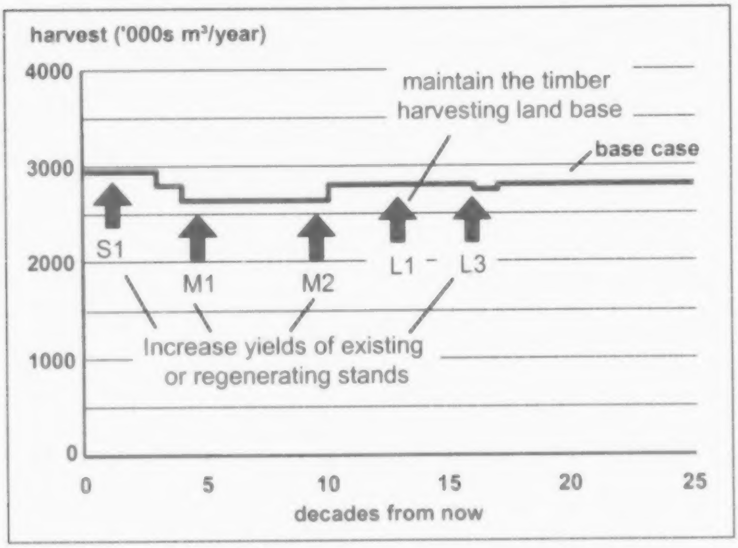


Figure 2.3.11 Location of timber supply effects of the selected strategies.

Caribou Habitat Recruitment R&D

The project to recruit caribou habitat was ranked as number 2.

Use of Improved Seed

Ensuring that the entire timber harvesting land base was planted with improved seed was ranked 3. This activity implements strategy L3, which is to increase the yield of future stands and increase timber supply in the long term.

Caribou Habitat Maintenance

Maintaining caribou habitat was ranked 4.

Managed Stand Fertilization

The fertilization program was ranked 5. This program implements strategies S1, M1, M2, and L3, to increase yields of existing and regenerating stands.

Grizzly Bear Habitat Maintenance

Precommercial thinning to enhance disturbed Grizzly bear habitat is ranked 6

Timber Quality Enhancement

Pruning to ensure a supply of clear logs (strategy Q1) is ranked 7 and last.

Lodgepole Pine Stem Rust Decision Support

This tactic, though not ranked in Tables 2.3.7 and 2.3.8, is strongly recommended to support all Lodgepole silvicultural tactics in the TSA. Lodgepole stem rust damage may be addressable through silvicultural interventions. Locally developed tactics must be developed to minimize the impact of these diseases. Three information gaps which must be addressed are:

- What is the volume growth impact of low, moderate and high infection levels of each rust species. This question will require an integrated pathology/growth modeling solution.
- What is the relationship between local geography and rust infection risk. Pine rust hazard mapping will improve the efficiency with which problem stands are identified, surveyed and treated.
- What level of lethal infection can be tolerated when density management interventions are planned for a stand. Expert examination of medium/high incidence is a crucial pre-requisite to correct interpretation and stand prescription. The biological performance, and hence the silvicultural investment return depends on the selection of appropriate treatment measures.

An annual funding commitment of $25 000 is required for stem rust tactical studies.

Table 2.3.8 Recommended silvicultural strategies for the Mackenzie TSA

Silvicultural Strategy	Silvicultural Tactics		Opportunity Area (Ha/Yr)	Timber Supply Effects Short	Timber Supply Effects Medium	Timber Supply Effects Long	Quality	Habitat	Jobs Days/ha	Cost $/ha[1]	Priority Rank
	Surveys										
	1	Surveys - general	15 900						0.05	20	nr
	2	Survey - burn	8-10 000						0.05	20	nr
	3	Survey, FG - pre-87	70 000 total						0.05	20	1
	4	Field Sampling	130 000 total						0.05	20	1
	Backlog - understocked pre-87 logging-origin stands										
L1	5	fill plant	550 ha over 2 yr		M	M			2.0	1000	1
L1	6	brush and weed	1 350 1 yr			M			2.0	1100	1
L3	7	Plant improved seed - 100 % of timber harvesting land base	10 000		++	++	+?	+	2.0	100	3
	Fertilize - Pl, Sx (25%G,M,25%P)		1 000								
S1	8	Pl late rotation -harvest in decade 2		+			+	- ?	0.1	400	5
M1	9	Pl late rotation			+		+	- ?	0.1	400	5
L3	10	Pl, Sx regenerating			+	+	+	- ?	0.1	400	5
	Fertilize, repeat 15 year cylce										
M2, L3	11	Pl,Sx (25%G,M,25%P)	1 000		++	++	+/-	- ?	0.1	400	5
	Prune										
Q1	12	1st lift Pl	100				+		4.0	1500	7
Q1	13	2nd lift Pl	100 in yr 8-10				+		5.0	2000	7
H1	14	**Recruit caribou habitat**	8-10 000 ha total					+	???	???	2
H2	15	**Maintain caribou habitat**	5 000 total					+	???	???	4
H3	16	**Space - Grizziy habitat**	2 500/10 years		-?	-		+	???	???	8

Notes:

+, - indicates, respectively, a positive or negative impact on the indicated objective.

+/- indicates that the activity could have a positive or negative effect, depending on its circumstances of application

M necessary to maintain the TSR; TSR assumption

nr not ranked

Activity 1, general surveys, is estimated to be three times the annual total program level of 5100 ha

Activity 12, repeat fertilization impacts on quality depend on branchiness and product requirements

Activity 12, repeat fertilization impacts on habitat is -ve it is caribou habitat

2.3.7.2 RECOMMENDED KNOWLEDGE STRATEGIES

There are many related TSA silvicultural issues not directly addressable via silvicultural practices. Many of these require investigation and further study. Table 2.2.9 identifies, and ranks the importance of 10 Sustainable Harvest knowledge gap issues.

Table 2.2.9 Recommended Sustainable Harvest Knowledge Investments

Knowledge Gap Issue	Rank
Investigate plans for improved Pl seed for the district.	0
Confirm or refine site productivity estimates for the TSA.	1
Develop a growth and yield monitoring strategy (including the effects of leader weevil and root collar weevil).	2
Review the green-up ages used in the TSR and clarify how they were derived. Confirmation of these green-up ages may require a sampling project.	3
Confirm or refine the OAF1 estimates of the TSR with OAF1 surveys	4
Establish spruce fertilization trials, emphasizing both late rotation and early fertilization regimes.	5
Support and participate in the caribou high trials.	6
Post TSR2, investigate opportunities on non-merch and low sites.	7
Evaluate the need and opportunity for Pw pruning.	7
Establish fertilization trials in Pl age 30-50	8
Establish spruce pruning trials and determine if timing is a factor in success or failure.	9

Though not ranked in Table 2.2.9, stakeholders in the TSA have recommended that an investigation into the potential significance of the large component of poor and low-site spruce stands on the TSR1 base case and the minimum harvest age sensitivity test results. If these effects are confirmed and are not simply a modelling artifact (e.g., a result of a harvest queue rule), the effects of various silvicultural practices should be explored, particularly pre-commercial thinning, to reduce the minimum harvest ages of these or other stands.

2.4 DAWSON CREEK TSA SUSTAINABLE HARVEST ISSUES AND SILVICULTURAL STRATEGY

This section describes the key sustainable harvest issues in the Dawson Creek TSA, and defines a provisional silvicultural strategy to address them. The following strategic analysis is based on a recently completed Type I Silvicultural Analysis, but requires further, detailed forest analysis and modelling in the Type II analysis. In the meantime, this provisional strategy is reflected in the proposed, 5 year Sustainable Harvest Plan for the Dawson Creek Forest District (Section 2.8).

2.4.1 THE RESOURCE LAND BASE

The Dawson Creek TSA covers 2 277 753 hectares, of which 811 662 (36%) is considered to be in the timber harvesting land base.

The site class profile of the timber harvesting land base is: 45% poor, 43% medium and 12% good site.

In Figure 2.4.1, old refers to deciduous and stands dominated by pine, which are older than 80 years. For all other species old refers to stands which are older than 100 years. Older stands account for 54% of the timber harvesting land base, while 46% is accounted for by younger stands. Sites categorized as good account for 12% of the timber harvesting land base, while medium sites account for 45%, and poor sites account for 43%. A majority of the forest which will be harvested in the short term will be coming from spruce and balsam sites with poor site quality

Mature pine stands less than 19.5 metres have been separated from other pine stands in the analysis because these stands will not yield a log of merchantable length. Since these stands are separated they can be tracked throughout the models planning horizon.

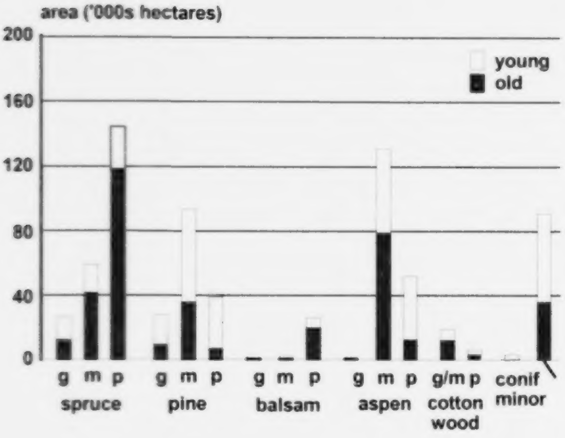


Figure 2.4.1 **Area of dominant tree species, quality of site, and maturity of stand in the timber harvesting land base, Dawson Creek TSA 1994**

2.4.2 RESOURCE SUPPLY ISSUES

2.4.2.1 TIMBER SUPPLY – VOLUME

Resource Inventory and Growth and Yield Information - The present forest resource inventory is out of date, and there is considerable uncertainty regarding its accuracy and reliability. Specifically, there are insufficient Phase II VRI sampling by strata, lack of Phase I VRI; unreliable representation of forest attributes for establishing legal objectives for landscape units; unreliable volume estimates for expected rates of growth (especially for the small pine partitioned harvest). This uncertainty, in turn, confounds attempts to define measurable resource management objectives, and prevents development of a soundly based silvicultural strategy

There are presently no satisfactory estimates of future productivity from residual subalpine fir in spruce-overstorey removal shelterwoods. This uncertainty hinders projection of future yields, and makes it difficult to evaluate the suitability of the advance regeneration on these sites. Approximately 13% of the TSA harvest comes from this forest type, yet there are currently no suitable yield projection models for these stands.

There is also uncertainty regarding the actual productivity potential for all stands in the TSA, particularly current and backlog managed stands, deciduous and complex. The Old Growth Site Index (OGSI) project suggests that site productivity may be underestimated for regenerating stands. Current estimates for complex stands (e.g., mixedwoods) are also known to be unreliable. Current volume estimates and yield projections do not represent local stand dynamics. Timber supply implications relating to deciduous/coniferous land base, silviculture obligations, and seral distribution at the landscape level.

Pre-'87 Backlog Status - A key sustainable harvest issue in the Dawson Creek Forest District is that of ensuring the establishment of commercial conifer and deciduous tree stocking on these sites. Backlog NSR areas must be fully stocked in order to meet TSR assumptions.

Mixedwood Management Objectives - Management objectives and strategies for mixedwood stands are not clear. The dynamics of broadleaf/conifer mixtures in the TSA are not well understood. Most acute is the lack of growth and yield decision support tools for mixed species, which prevents meaningful projection of growth, yield and silvicultural response. A related issue concerns the current management practice of splitting the resource land base into coniferous and deciduous components for determination of allowable annual cut (AAC) and harvest nd other management practices. This frustrates the implementation of sound silvicultural management.

Alternative Silvicultural Systems -The is considerable uncertainty concerning the strategic level impacts of applying silviculture systems other than clear-cutting at the stand level. Stakeholders are unable to incorporate selection and partial cutting silviculture systems in timber supply analyses and landscape unit planning.

2.4.2.2 TIMBER SUPPLY – QUALITY

No studies on timber quality have been completed and no assumptions regarding timber quality were made in the 1994 Timber Supply Review. There are currently no timber quality issues recognised for the TSA.

2.4.2.3 HABITAT SUPPLY

Natural Disturbance Regimes - Seral stage distribution concerns are different east of the Rockies than in the rest of the province. The natural fire disturbance regimes are not being reproduced through implementation of the Forest Practices Code and in many landscape units/BEC subzones. The old forest requirements do not, nor have they ever, existed in the TSA, reflecting the frequent fire disturbance history. This issue affects the supply of habitat for most native species.

Caribou - The NE has terrestrial lichen foraging caribou. Much of the caribou range is being managed through LRMP and TSR provisions. Silvicultural interventions that prolong the usefulness of winter habitat and create new winter habitat should be favoured, although the areal extent of required habitat is not currently known.

Grizzly Bear – There is intense public concern regarding the impact of forestry activities on grizzly bears. This concern exists at the international, national and local levels. Grizzlies are provincially blue-listed and are a species of special concern at the national level. Both the Prince George and Dawson Creek LRMPs provide direction to incorporate the conservation of grizzly bear habitat into forest management activities.

The primary issue concerning grizzly bears is the availability of forage in areas of high grizzly value. Excessive herbicide use destroys the leafy, berry producing trees and shrubs that are used as grizzly forage. This issue may be adequately addressed in Pest Management Plans; otherwise, large reserves of preferred habitat should remain pesticide free.

Additional information on habitat selection by grizzly bears is required to optimize the placement of Wildlife Habitat Areas, and to establish appropriate Landscape Unit objectives for age class, patch size, connectivity and access management that will achieve the conservation of grizzly bear habitat within managed landscapes. Scientifically based conservation measures to protect grizzlies are likely to be a requirement for environmental certification of wood products.

Range Quality – Deciduous regrowth following harvesting of range permit areas may be reducing the quality of primary range.

Non Commercial Cover Conversion - Areas of non-commercial brush (primarily willow and grass) are being converted to spruce plantations. This usually requires the use of herbicides to control vegetation competition. The economic viability of some of these stand conversion treatments is questionable, and there may be some rare ecosystems being impacted. Greater provision of riparian reserves, wildlife tree patches, and seral willow/grass community reserves should be incorporated into stand conversion projects.

2.4.3 SILVICULTURAL PRACTICES

2.4.3.1 INCREMENTAL SILVICULTURAL HISTORY

Table 2.4.1 documents the backlog (pre-'87 openings) silviculture undertaken in the TSA. Only silvicultural activities which took place after 1985 are recorded. Table 2.4.2 documents the current (post '88 openings) silviculture accomplishments to 1999.

Table 2.4.1 Backlog silviculture history 1986-99 , Dawson Creek TSA.

Year	Backlog Site Preparation (ha)	Backlog Planting (ha)	Backlog Brushing (ha)	Backlog Spacing
1986	6189.9	2734.8	77	19
1987	4766	5106	129	51
1988	1141.6	4519.9	454	25
1989	453.3	3403.3	1014	139
1990	207.4	1571.8	1945	
1991	776	1395.7	1190	96
1992	1063	890.1	630	32
1993	593.8	577.4	2456.1	53
1994	292.5	281.5	1513.8	22.8
1995	1620.7	444	1247.3	15.9
1996	16.5	211.7	1170.3	
1997		2	1395.1	11.2
1998		255.7	1030.1	104.2
1999		297.5		
Total	**17120.7**	**21393.9**	**14549.2**	**569.1**

Table 2.4.2 Current silviculture history 1986-99 , Dawson Creek TSA.

Year	Backlog Site Preparation (ha)	Backlog Planting (ha)	Backlog Brushing (ha)	Backlog Spacing
1988	938.8			79
1989	1707.7	855.2		6
1990	2589.1	1838.3	55	116
1991	2376.2	2631.5	907	
1992	4297	2318.8	74.1	
1993	1800.2	3174.6	700.7	
1994	963.4	4141.1	182.3	
1995	799.5	2588.4	701.4	
1996	499.5	2038.4	1464.7	128.2
1997	691	1616.6	1223.5	49.3
1998	269.2	1353.3	843.5	
1999	18.9	490.9	610.5	
Total	**16950.5**	**23047.1**	**6762.7**	**378.5**

2.4.3.2 BACKLOG SILVICULTURE

The area of backlog not satisfactorily restocked land is 15,000 ha, of which 10% will require full stand rehabilitation. Since regeneration surveys conducted prior to 1995 did not consider commercial deciduous species as acceptable stocking on at least 20% of backlog NSR areas, their reported regeneration status is questionable. Acceptance of deciduous stocking on some backlog areas will positively affect deciduous wood supply in the long term.

Additional surveys will be needed to confirm acceptable stocking in backlog NSR areas. Use of herbicides to facilitate conifer crop establishment and to release conifers from brush competition is essential in stand rehabilitation prescriptions. Currently there are no plans to rehabilitate age class 9 balsam stands to pure spruce stands, or to rehabilitate height class 2 pine stands to normal profile pine stands.

2.4.3.3 PRECOMMERCIAL THINNING

Precommercial Thinning (juvenile spacing) has never been a silvicultural priority in the Dawson Creek TSA, as the historical figures in Tables 2.4.1 and 2 indicate. When prescribed, the conventional thinning regimes identified in Table 2.4.3 are implemented.

Table 2.4.3 Precommercial thinning regimes, Dawson Creek TSA

Species	Spaced From (stems/ha)	Residual Density (stems/ha)
At	2000-5000	2500
At	>13000	2500
Pl	2000-10000	1200
Pl	>25000	1200
Sw	7000	1200
Sw	>12000	1200

2.4.3.4 TREE IMPROVEMENT

The projected gain from improved seed for the Dawson Creek TSA is tabulated in Table 2.4.4.

Table 2.4.4 Project gain from improved tree seed, Dawson Creek TSA.

Species & Seed Zone	Elevation (m)	Gain from Improved Seed (%)		
		98-99	99-00	2007-08
Sx PR low	<1200	-	-	23
Sx PG low	<1200	14	15	17
Sx PG high	>1200	17	17	16
Fdi PG all	<1100	19	19	19

2.4.4 TSR 1 MANAGEMENT ASSUMPTIONS

In addition to the inventory, or current state of the forest, assumptions about how it will be managed as essential for determining a silviculture strategy.

2.4.4.1 INVENTORY PROFILE

The inventory profile (species composition) of the timber harvesting land base is expected to change over time. Table 2.4.5 records the trend in species profile resulting from the harvesting schedule of the TSR base case. Mixedwood stands are a component of Table 2-8.

Table 2.4.5 Current inventory profile by volume and area, Dawson Creek TSA 1994.

Species	Current Species Profile of the THLB	
	Volume%	Area%
B	22	4
P	28	32
S	28	29
At	22	35
Total	**100**	**100**

2.4.4.2 MANAGEMENT ZONES AND FOREST COVER REQUIREMENTS

The TSR management zones and their associated forest cover requirements are listed in Table 2.4.6 and the minimum harvest ages are summarized in Table 2.4.7.

Table 2.4.6 Management zones and forest cover requirements, Dawson Creek TSA 1994

Management Zone		Age 1 (years)	Maximum per cent area younger than Age 1
1	Coniferous leading, general	23	33
2	Coniferous leading, retention VQO	27	6
3	Coniferous leading, partial modification VQO	30	13
4	Coniferous leading, modification VQO	28	24
11	Deciduous leading, general	10	33
12	Deciduous leading, retention VQO	15	8
13	Deciduous leading, partial retention VQO	15	14
14	Deciduous leading, modification VQO	15	29

Table 2.4.7 Minimum harvestable ages by leading species and site class, Dawson Creek TSA 1994

Species	Site:		
	G	M	P
Sb	80	100	150
P	60	70	90
B	70	80	130
At	60	70	80
Ac	70	70	80
Coniferous minor	70	70	70
Pl, height class 2	80	80	80

2.4.4.3 HARVESTING PRACTICES

The 5-year average area harvested is 3 343 ha. This area is a combination of coniferous and deciduous area. 99.9% of the THLB area is managed under even-aged silvicultural systems (clearcutting), generating 99.7% of the TSA volume.

The annual harvested area will increase in the next 20 years and for the foreseeable future for two reasons: 1. a new deciduous licence, amounting to 600 000m^3, has been awarded, and 2. a greater amount of partial cutting (in conifer stands) is expected.

2.4.5 TIMBER SUPPLY DYNAMICS AND THE AAC

The Dawson Creek TSA timber supply analysis (1994) separates the timber supply forecast into coniferous and deciduous components. This section is therefore pesented in two parts:

- Coniferous Timber Supply Dynamics, which deals only with the coniferous harvest forecast and sensitivity analysis;
- Deciduous Timber Supply Dynamics, which deals only with the deciduous harvest forecast and sensitivity analysis.

2.4.5.1 CONIFEROUS TIMBER SUPPLY DYNAMICS

The 1994 TSR, upon which the current AAC determination was based, shows forecasts an even-flow harvest of 972 000 m^3 maintained throughout the entire planning horizon (Figure A1-1). This harvest level is approximately 13% higher than the current AAC. Mature pine stands less than 19.5 metres will contribute 164,000 m^3 per year, or 15% to the total annual harvest from coniferous stands.

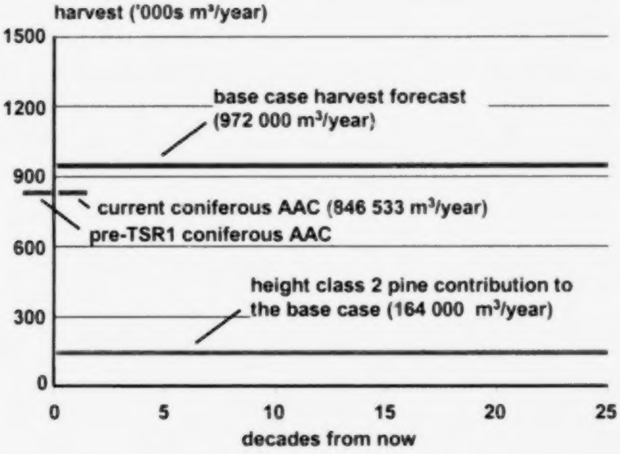


Figure 2.4.2 **Coniferous base case harvest forecast, Dawson Creek TSA, 1994.**

This even-flow harvest level for coniferous stands can be attributed to a low rate of harvest that is close to the productive capacity of the management unit and the age class structure of the coniferous timber harvesting land base (Figure 2.4.3). Extensive stands of mature timber allow the heavily concentrated younger stands (ages 80 to 110 years) to be preserved until later periods. These younger age classes can mature and be gradually harvested, while the regenerating stands mature. The age class distribution at 150 years (not shown) suggests a "normal" forest.

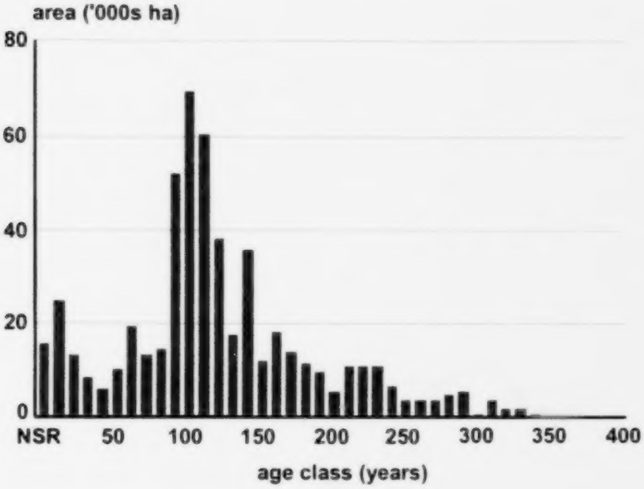


Figure 2.4.3 **Current coniferous age class distribution-timber harvesting land base, Dawson Creek TSA 1994.**

Even-Flow Harvest Level Effects

The even-flow harvest level rations mature merchantable stands until later periods allowing younger stands to reach merchantable ages without a decline in the harvest level. This drawing down of the mature stock is demonstrated in Figure 2.4.4, which forecasts a steady decline in total and harvestable growing stock for the first 100 to 150 years. After this time, both measures of stock increase and reach a steady long-term level.

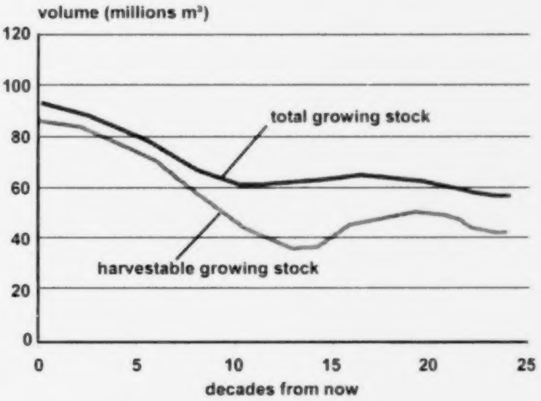


Figure 2.4.4 **Total and harvestable growing stock, coniferous base case, Dawson Creek TSA, 1994**

The average volume per hectare of timber harvested over time (not shown) remains steady until 150 years when there is a decline in the average volume. The average age of harvested stands (Figure 2.4.5) declines quickly over the first 4 decades of the planing period from 280 years to 180 years, and then more slowly to the long-term level of 130 years. This decline can be attributed to older stands ranging in ages 130-340 years being harvested for the first 40 years. Once these stands are harvested, the average age declines as the heavy concentration of younger stands become merchantable.

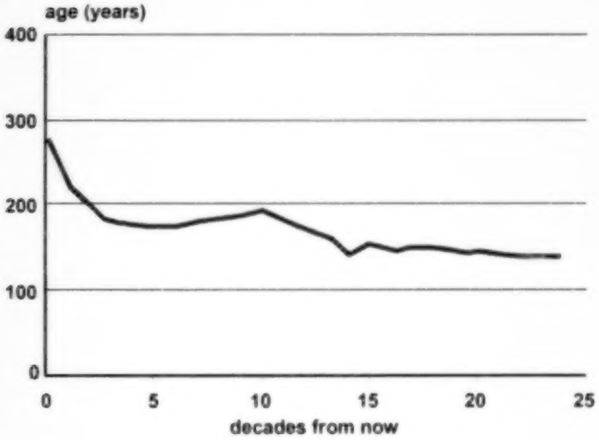


Figure 2.4.5 Average age of harvested stands over time, coniferous base case, Dawson Creek TSA, 1994

Robustness of the Base Case Harvest Forecast

Figure 2.4.6 demonstrates the robustness of the base case harvest forecast. The initial harvest level can be increased by 17% above the base case forecast, and reduced gradually over 2 decades (<10% per decade) down to the LTHL. If the initial harvest level is increased by 51%, the reduction to LTHL occurs over 4 decades and a shortfall is forecast to occur at 180-200 years.

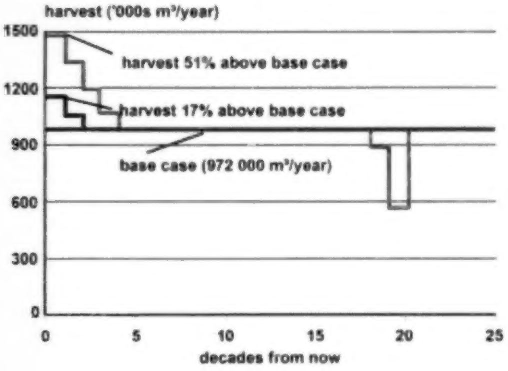


Figure 2.4.6 Alternative harvest flows using the coniferous base case, Dawson Creek TSA, 1994

Green-up and Cutblock Adjacency

A 5-year decrease in green-up age results in a small benefit of about 1.5% of the even flow rate across the entire planning horizon. This increase can be attributed to increased harvesting in visually sensitive areas, which were previously set aside until the age when a required height was reached.

In the coniferous base case forecast the forest cover requirement used to model cutblock adjacency is based on the assumption that a maximum of 33% of the area can be less than 3 metres tall at any given time – a 3-pass harvesting system. Increasing the constraint to a 5-pass system does not change the base case forecast. Figure 2.4.7 illustrates the effects of harvesting on a 6-pass system -- modest shortfalls occur periodically across the planning horizon. This result reinforces the earlier observation that the base case harvest forecast is quite robust.

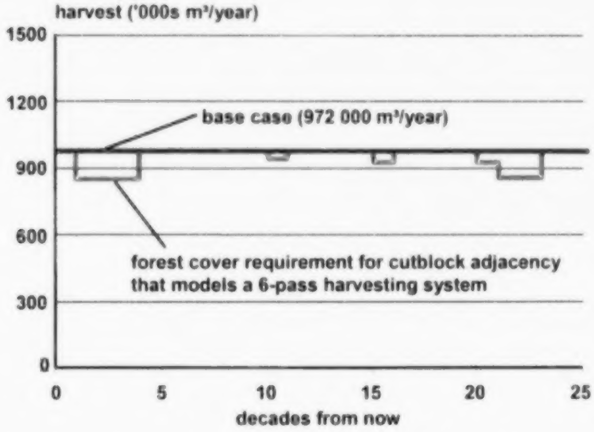


Figure 2.4.7 **Coniferous harvest forecast with a more stringent cutblock adjacency requirement, Dawson Creek TSA, 1994**

Changing Stand Yields

Increasing existing stand yields causes a 16% increase in the initial rate of harvest (Figure 2.4.8). This long-term level is maintained until period 160 when there is a step down to the long term harvest level.

Figure 2.4.8 also shows the implications of increasing and decreasing the regenerated stand volumes by 20%. Note that the effects of changing yields of existing and regenerated timber were determined independently.

Also plotted on Figure 2.4.8 is the transition (estimated) from natural to managed stands. This transition at 180 years marks the end of the mid-term of the timber supply forecast and the beginning of the long term. The short term is arbitrarily defined as the first two decades.

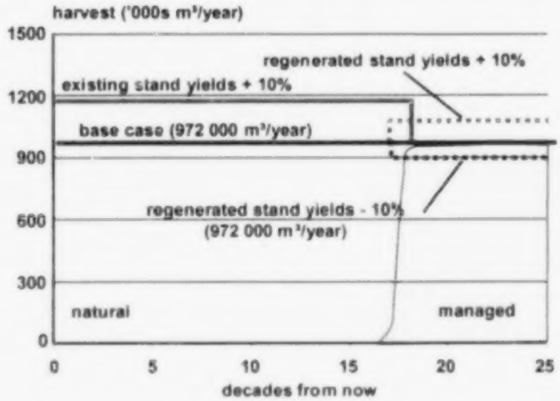


Figure 2.4.8 Coniferous harvest forecasts with changes in estimated stand yields

Coniferous Timber supply Dynamics -- Summary

The base case harvest forecast for coniferous stands is even-flow due to two features: the low rate of harvest (pre-TSR and current) that is close to the productive capacity of the management unit, and an age class structure that is heavily weighted to mature timber.

This timber supply forecast is robust with respect to management modelling parameters such as green-up age and adjacency. Increasing existing and regenerated stand yields results in significant increases in timber supply.

2.4.5.2 DECIDUOUS TIMBER SUPPLY DYNAMICS

The 1994 TSR, upon which the current AAC determination was based, shows the deciduous allowable annual cut can be maintained for 10 years without causing a reduction in future harvest levels (Figure 2.4.9). Starting from the current deciduous AAC of 886 500 m^3/yr , the harvest declines steeply at 22% each decade until the long term harvest level of 480 000m^3/yr is reached in the fourth decade. The LTHL is 46% lower than the current AAC. Cottonwood stands are expected to contribute 92 000 m^3 per year, or 11% to the total harvest from deciduous stands over the long term.

Impending Scarcity of Harvestable Timber

Figure 2.4.10 overlays total and harvestable growing stock on the projected harvest for the base case forecast, showing how the timing of the depletion of the growing stock coincides with the reduction in harvest level or falldown. The harvestable growing stock is at its minimum level in decade 7, indicating a scarcity of timber in decades 6-8.

Figure 2.4.11 displays the deciduous age class distribution of the timber harvesting land base currently, in 50 and in 100 years. Much of the area in the current age class distribution is between 70 and 120 years old, with little timber in the younger age classes. An important management consideration in this TSA is the increased risk of decay in aspen and cottonwood older than 120 years, suggesting that a high rate of harvest might be desirable in the first few decades. Another important factor affecting the choice of short-term harvest level in the base case forecast is the need to ration the stock of existing mature timber until enough regenerating stands reach minimum harvestable age to support the long-term harvest level.

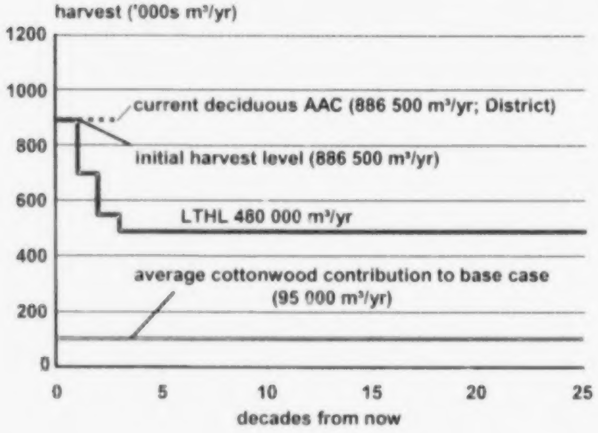


Figure 2.4.9 Deciduous base case harvest forecast, Dawson Creek TSA

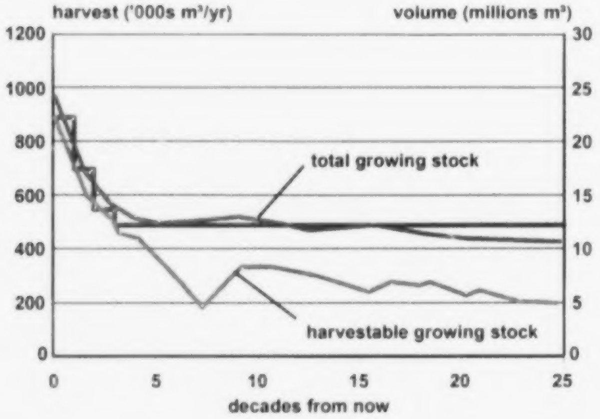


Figure 2.4.10 Deciduous base case harvest forecast and growing stock inventory, Dawson Creek TSA

Rationing Existing Mature Timber

The rate at which the stock of existing mature timber can be depleted depends partly on the rate at which existing immature and regenerated timber becomes large enough to harvest. Since there is a shortage of young stands in the existing forest, the harvest level must be reduced rapidly after the first decade to conserve existing mature timber for harvesting in later decades. The LTHL of 480 000 m³/yr is reached in decade 4.

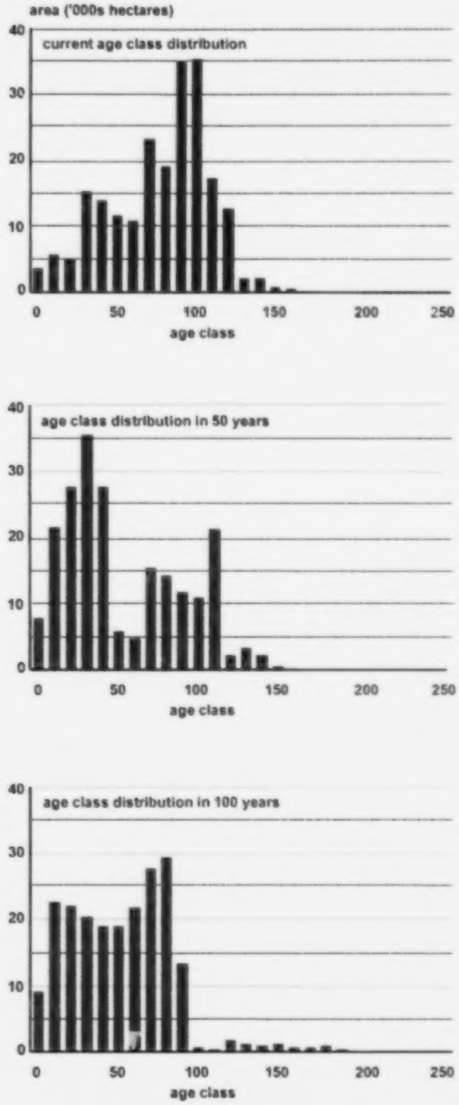


Figure 2.4.11. Stand age class distribution over time, deciduous base case Dawson Creek TSA

Figure 2.4.12 shows alternative forecasts for comparison with the base case. If the initial harvest level is set at 985 000 m^3/yr, the LTHL must be reduced to below that of the base case. In other words, the rate of harvest must be constrained to ensure that the inventory is not drawn down too quickly. It is this mechanism shaping timber supply – constraints on the rate of change of the harvest level – that provides a means of capturing silvicultural benefits in the short term. Note that the efficacy of this effect is determined by the shape of the timber supply forecast and hence is specific to a management unit.

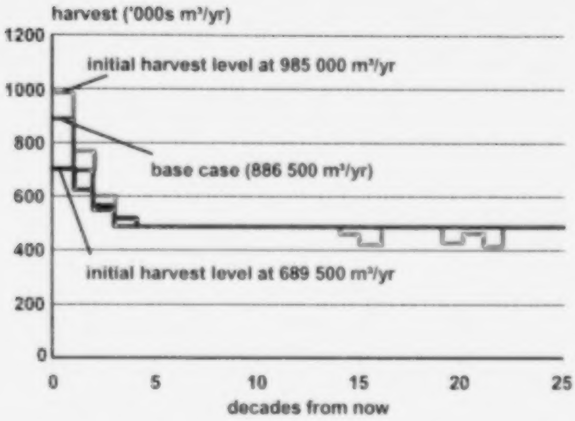


Figure 2.4.12. **Alternative harvest flows using the deciduous base case, Dawson Creek TSA Addendum, 1996**

Minimum Harvest Ages

Minimum harvest ages were set by District staff based on the age at which the average annual volume growth of a stand is within 5% of its maximum or "culmination" age. Minimum harvestable ages might be reduced further through silviculture, and Figure 2.4.13 illustrates how much and when timber supply might be affected by doing so.

In the short term, reducing minimum harvest ages results in a significant increase in timber supply. Reducing minimum harvestable ages makes young and regenerating stands available for harvest sooner, and increases the amount of timber that is currently above the minimum harvestable age. The combination of volume available from both the young and older age classes increases the harvest level.

Increasing the minimum harvestable age has no short-term effect, and a small long-term effect on harvest levels because the minimum harvestable ages are just slightly less than the culmination ages. Since the majority of stands have reached culmination increasing the minimum harvestable age has no effect on the harvest level. If there were no surplus of mature stands, increasing the minimum harvestable age would mean regenerating stands could not be harvested as early in the planning horizon, therefore harvest levels would have to decrease as mature stands are depleted.

Green-up

As illustrated in Figure 2.4.14, a 5-year decrease in green-up results in benefits across the entire planning horizon. The even-flow rate of harvest can be increased to approximately 4% above the base case. Again this increase can be attributed to increased harvesting in visually sensitive areas. Increasing the green-up ages means that harvestable area is constrained until certain height requirements are met.

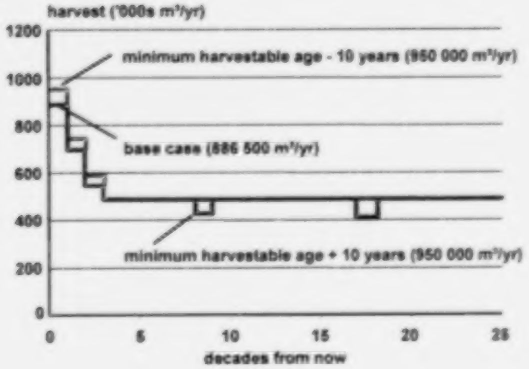


Figure 2.4.13 Deciduous harvest forecast with minimum harvestable ages +/- 10 years

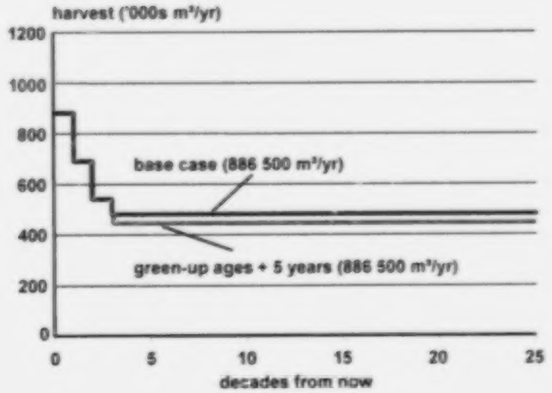


Figure 2.4.14 Deciduous harvest forecast with green-up periods + 5 years, Dawson Creek TSA Addendum, 1996

Increasing Stand Yields

Increasing stand yields has a significant effect on the short and long harvest levels (Figure 2.4.15). Since there is a majority of stands over the minimum harvestable age, increasing yield estimates will mean that increased volume will be obtained from these stands. As the older stand are used up, there will be a decline in the harvest, as seen with the base case, but the harvest level will be greater than the base case because regenerating stands will have greater volumes contributing the harvest level.

Decreasing the stand yields causes a drastic decline in the harvest level. This can be attributed to the fact that the potential volume from the mature stands is lessened due to the decreased yield estimates. As these mature stands are harvested there is a steady decline in the harvest level. Once the regenerating stands reach minimum harvestable age the long term harvest level is reached, but is below the base case because of decreased yield estimates.

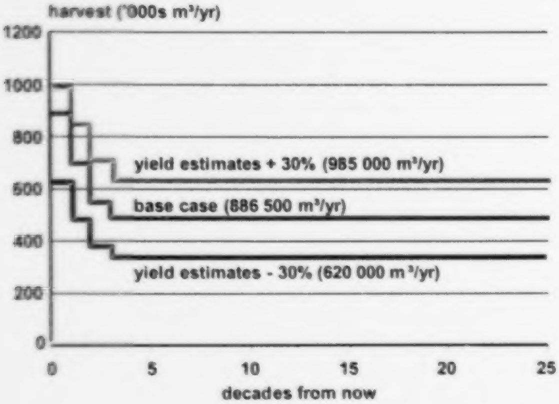


Figure 2.4.15 Deciduous harvest forecast with adjusted yield estimates

Increasing the Timber Harvesting Land Base

Various silvicultural activities can be interpreted as bringing land into the timber harvesting land base and so the TSR sensitivity analyses of the effect of increasing the timber harvesting land base (Figure 2.4.16) will provide information on the magnitude and timing of the benefits. Increasing the timber harvesting land base increases timber supply across the whole planning horizon.

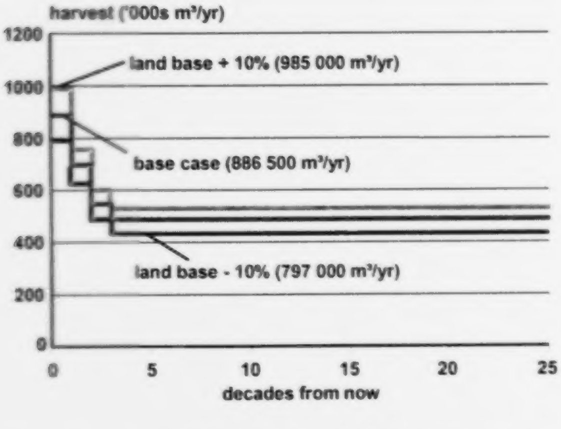


Figure 2.4.16 Changes to the timber harvesting land base

Deciduous Timber supply Dynamics -- Summary

The supply of deciduous timber in the Dawson Creek TSA is shaped by the interaction of the productivity of the unit, the current rate of harvest, and administrative constraints on harvest flow. Specifically, the age class structure of the TSA is characterized by a physical shortage of younger stands approaching minimum harvesting age and the current and scheduled rates of harvest substantially exceed the growth rate and the long term harvest level. This physical shortage of supply is brought forward to decades 2 and 3 by the constraints on the rate of change of the harvest level, which ration the remaining mature timber to sustain the harvest through the periods of scarcity.

2.4.6 KEY ISSUES AND POTENTIAL SILVICULTURAL STRATEGIES

This section identifies the key Sustainable Harvest issues facing the TSA, as well as potential silvicultural strategies considered suitable to address them. Of those resource supply issues described in Section 2.4.6, four were considered key by management unit stakeholders:

- Uncertainty about critical inventory and growth and yield information
- Productivity losses associated with backlog sites in the timber harvesting landbase
- Potential deciduous timber supply falldown in the short, medium and longterm
- Uncertainty of security of coniferous timber supply

Potential silvicultural strategies are those silvicultural interventions having potential to either maintain or increase future timber supply at the TSA level. Strategies considered feasible and desireable by Dawson Creek stakeholders are listed in Table 2.4.8. The forest level impacts of each stategy and tactic are estimated in Table 2.4.9. This set of strategies must be considered provisional at this time; they must be analysed and evaluated in further forest estate modelling. Local technical expertise, current policies and present uncertainties surrounding some of the following strategies are reflected in the SH investment recommendations.

Table 2.4.8 Potential silvicultural strategies and tactics in the Dawson Creek TSA.

Key Issues	Silvicultural Strategies	Silvicultural Tactics	Target Stands	Rank
Uncertainty in critical issues	**1-1** Improve Knowledge (SI estimates on backlog)	add growth intercept to FG surveys of treated backlog	Backlog NSR	1
		add growth intercept to FG surveys (re FG)	Backlog NSR (in BWBS)	1
	1.2 Improve Knowledge (Deciduous Stocking)	expand survey to include deciduous—update ledger	Regenerated stands	1
	1-3 Improve Knowledge (Monitoring for vegetation management)	install NIVMA plots		1
Loss of Productivity on Backlog Sites	**2-1** Maintain Timber Harvesting Land Base (Retire all NSR)	survey to determine opportunities	NSR backlog	1
		conifer treatment regimes		1
		deciduous treatment regimes		1
		mixedwood treatment regimes		1
	2-2 Maintain Timber Harvesting Land Base (Convert NCbr to THLB	Cut and pile mound, plant, herbicide, survey, fill-plant	NC Br	3
	2-3 Maintain Timber Harvesting Land Base (Convert NCbr to grazing land)	survey and grazing plan	NC Br	2
		MSP and seeding		3
Decline in Deciduous Harves	**3-1** Increase Yields (Protect regenerating aspen stands from grazing)	grazing plan to move cattle out of susceptible young stands	BWBS – all stands	2
		implement grazing plan	BWBS – all stands	3
Security of Conifer Harvest	**4-1** Improve Operability (Reach FG earlier)	survey (pre-early FG)	Shelterwood Stands in ESSF	3
	4-2 Maintain Productivity of Timber Harvesting Land Base (Mitigate impact of calamagrostis)	develop methodology for assessing risk pre-harvest	BWBS – all stands	1

Table 2.4.9 Recommended silvicultural strategies for the Dawson Creek TSA.

Key Issues	Objectives	Silvicultural Strategies	Silvicultural Tactics	Target Stands	Opportunity Area (ha)	----Timber Supply Effects ----				Habitat Effects	Jobs Days/ ha	Cost $\$/ha^{1}$	Rank
						Short	Mid	Long	Qual				
Uncertainty - critical SH issues	Reduce uncertainty in critical SH management issues	**1-1** Improve Knowledge-Productivity potential (	add growth intercept (to reforested backlog FG surveys)	backlog NSR	2500	0	+/-	+/-	?	0		10 to 30	1
			add growth intercept to FG surveys (re FG)	backlog NSR (in BWBS)	2500	0	+/-	+/-	?	0		10 to 30	1
		1-2 Improve Knowledge Deciduous stocking	expand surveys (to include deciduous to conifer stocking assessment pdate ledger)	regenerated stands	2500	0	+/-	+/-	0	0		2	1
		1-3 Improve Knowledge-Response Monitoring	install NIVMA plots		6 - 8 plots/yr	0	+	+	0	+/-		1100/plot	1
Productivity losses- backlog	Maintain historical production levels	**2-1** Maintain THLB- Retire all NSR	survey to determine opportunities	NSR backlog	2500/yr	0	+/-	+/-	0	0		40	1
			conifer treatment regime		800/yr	0	+/-	+/-	0	0		1800	1
			deciduous treatment regime		800/yr	0	+/-	+/-	0	0		0	1
			mixedwood treatment regime		900/yr	0	+/-	+/-	0	0		2600	1
		2-2 Maintain THLB-Convert NCbr to THLB	cut and pile	NC Br	500/yr		+	+		0		350	3
			mound		500/yr		+	+		0		550	3
			plant		500/yr		+	+		0		1000	3
			herbicide		500/yr		+	+		0		450	3
			survey		500/yr		+	+		0		80	3
			fill-plant		500/yr		+	+		0		500	3
	shift grazing to non-productive land	**2-3** Maintain THLB (Convert NCbr to grazing land)	survey and grazing plan	NC Br	500/yr		+	+		-		25	2
			MSP and seeding		100/yr		+	+		-		500	3
Deciduous Supply Falldown	improve yields of regenerating aspen	**3-1** Improve Yields (Aspen Stand protection)	grazing plan (to move cattle out of susceptible young stands)	BWBS	1000/yr		+	+				25	2
			implement plan		1000/yr		+	+				50	3
Security of coniferous supply	improve operability of regenerating stands	**4-1** Improve Operability (earlier FG)	survey (pre-early FG)	shelterwood stands in ESSF	500/yr	+/-	+/-	+/-				50	3
	ensure prompt and complete restocking after harvest	**4-2** Improve Yields (mitigate impact of calamagrostis)	develop methodology for assessing risk pre-harvest	BWBS	1500/yr	0	0	0		0		10	1

2.4.6.1 ISSUE 1: UNCERTAINTY ABOUT CRITICAL INVENTORY AND GROWTH AND YIELD INFORMATION

Strategy 1.1: Improve Estimates of Site Productivity Potential of Disturbed Stands

TACTIC 1 IMPROVE SITE INDEX ESTIMATES FOR NON-FREE GROWING BACKLOG STANDS

Target Stands:

Backlog stands that are not FG. Survey 2500 ha/yr using the growth intercept method to obtain more accurate SI information. This updated information would be used to update productivity potential of analysis units for future timber supply reviews.

TACTIC 2 IMPROVE SITE INDEX ESTIMATES FOR FREE-GROWING, CURRENT STANDS IN THE BWBS BEC ZONE

Target Stands:

Current, free growing stands in BWBS BEC zone. Survey 2500 ha/yr using the growth intercept method to obtain more accurate SI information. This updated information would be used to update productivity potential of analysis units for future timber supply reviews.

Expected Forest Level Benefits:

The strategic aim of both tactics is to increase confidence of site productivity potential estimates by obtaining more accurate Site Index (SI) information on backlog and current stands. If site index values are underestimated in the TSA, improved information would allow for additional volume harvest in the mid and long term.

Strategy 1.2: Improve Estimates of Site Productivity Potential of Disturbed Stands

TACTIC 1 ADD DECIDUOUS SPECIES TO CONIFEROUS STOCKING ASSESSMENTS

Target Stands:

Recently regenerated areas throughout the TSA.

Expected Forest Level Benefit:

The strategic aim of this tactic is to utilize deciduous stocking where it exists, rather than invest effort to convert it to conifer stocking. This change in current practice requires that stocking surveys be modified to recognize deciduous species. The current management approach is to split the land base into separate components supporting coniferous and deciduous AAC's. This complicates decision-making since shifting hectares after harvest from one component to the other (e.g., coniferous to deciduous) would change the land base size, and therefore would affect future AACs.

The LRMP recommends maintaining the areas of deciduous and coniferous species at or near their present levels. Where stocking has changed from one to the other, it was suggested that some form of land base accounting (e.g., a ledger system) should be used. The recommendation was for equal areas presently deciduous to be changed to conifer where suited, e.g., a nurse tree shelterwood where the aspen is removed leaving a stocked spruce stand. This is a large issue that goes beyond maintaining deciduous vs. conifer stocking. It encompasses mixedwood management and the numerous pathways that it provides. Prior to implementing this approach, consultation with those responsible for mixedwood management policy is required.

It should be noted that currently where there is insufficient coniferous stocking in backlog NSR areas (from harvesting or fire disturbance origin) deciduous stocking of acceptable species and quality is recorded and retained. These areas are then managed for deciduous species, and should be added to the deciduous land base.

Strategy 1.3: Improve Knowledge of Silvicultural Responses

TACTIC 1 – MONITOR OPERATIONAL VEGETATION MANAGEMENT TREATMENTS (INSTALL NIVMA PLOTS

Target Stands:

All pre-free growing stands in the TSA.

Expected Forest Level Benefits:

In TSR1 the Chief Forester indicated that vegetation management issues could ultimately affect the mid-and long-term coniferous timber supply. Installation of NIVMA plots (6 – 8 plots per year) will track success of various operational treatment regimes, aiding in future yield projections and timber supply determinations.

2.4.6.2 ISSUE 2: PRODUCTIVITY LOSSES ASSOCIATED WITH BACKLOG SITES IN THE TIMBER HARVESTING LANDBASE

Strategy 2.1: Maintain or increase the timber harvesting land base

TACTIC 1 - RETIRE NSR

Target Stands:

All pre-'87 NSR and SR impeded backlog stands in the TSA.

Expected Forest Level Benefits:

A two-phased approach was suggested for retiring NSR. The first step is to survey to determine NSR status and treatment opportunities. Past practices, which were oriented to maintaining the coniferous land base, used conifer-dominated stocking standards. With recent harvesting of deciduous species there has been pressure to maintain the deciduous land bases and a re-examination of stocking standards. There is a need for improvement in the mixedwood stocking standards to allow for varying combinations of species given that many backlog areas have regenerated to mixtures of coniferous and deciduous species.

Draft mixed-wood stocking standards are available and may suffice for the time being. Recommendations for treatment options should be made for blocks not meeting the minimum stocking. The stands to be assessed are from the NSR backlog. A total of about 2500 ha per year has been suggested for assessment.

The second step is to implement regimes to address deficiencies in coniferous stocking. Conifer regime options include brushing existing stems, site prep, fill planting and additional brushing. An estimated 800 ha per year may be treatable. Deciduous regime– if deemed stocked with deciduous accept as is and record in a ledger accordingly. An estimated 800 ha per year may be treatable. Mixed-wood regime options include brushing existing stems, site prep, fill planting and additional brushing. An estimated 900 ha per year may be treatable. TSR1 assumes all of this land to be restocked to conifers. Some form of ledger is needed to account for deciduous-leading blocks.

TACTIC 2 – CONVERSION OF NON-PRODUCTIVE STANDS

and

TACTIC 3 – CONVERSION OF NON-PRODUCTIVE STANDS TO GRAZIING

Target Stands:

Non-productive categories of NSR backlog in the TSA, and NC Br in BWBS that can be converted to grazing land

Expected Forest Level Benefits:

The THLB may be increased by afforesting areas of NC Br. Target areas of NC Br that have been roaded since FRDA-funded conversions in the late 1980's. A rigorous treatment regime is required to successfully convert NCBR to make it operable. A regime of six treatments was defined, including: cut and pile, mound, plant, brush with herbicide, survey, and fill-plant. An estimated 500 ha per year may be treatable.

Depending upon the site productivity this strategy could increase the mid- and short-term harvest levels incrementally, possibly offsetting reductions from sub-optimal stocking elsewhere.

To reduce grazing pressure on newly restocked aspen cutblocks, the intent is to convert suitably located NC BR areas to grazing land. The first step is to determine the opportunities and feasibility for this to occur (with 500 ha to be assessed in the fist year). Once areas have been identified and surveyed, site preparation and seeding would follow (with 100 ha estimated for the first year).

2.4.6.3 ISSUE: PREDICTED DECIDUOUS TIMBER SUPPLY FALLDOWN

Stategy 3.1: Improve Yields of Existing and Regenerating Stands

TACTIC 1 – PROTECT REGENERATING YOUNG ASPEN STANDS FROM GRAZING

Target Stands:

recently harvested aspen cutblocks in the BWBS BEC zone.

Expected Forest Level Benefits:

The first activity needed to protect regenerating aspen stands from grazing is to create a grazing plan that enables successful establishment of deciduous harvest blocks (1000 ha might be appropriate in year one). The intent is to allow aspen stands to become fully stocked so as to provide medium-and long-term fibre. The grazing plan may require fencing or other forms of cattle management to limit access to recently harvested aspen cutblocks.

2.4.6.4 ISSUE 4: SECURITY OF CONIFEROUS TIMBER SUPPLY

Strategy 4.1: Improve Yields of Existing and Regenerating Stands

Two related sub-issues concern coniferous timber supply. Achieving full yield production is problematic where a balsam understory remains after harvesting the spruce overstorey in shelterwood systems in the ESSF BEC zone. The second sub-issue concerns the impact of vegetation competition of *Calamagrostis canadensis* on regenerating conifers.

TACTIC 1 - ASSURE ACHIEVEMENT OF FREE-GROWING STATUS

Target Stands:

Residual balsam remaining after removal of spruce overstorey in ESSF shelterwood harvests.

Expected Forest Level Benefits:

In blocks where spruce has been harvested leaving a balsam understory, the performance of the residual balsam is uncertain. To provide greater certainty for future predictions some form of analysis is required to provide better estimates of future growth and yield in these types. Discussion with the Regional Research Section should occur prior to any further work on this subject. Experience at the Aleza Lake Research facility and other partial-cutting initiatives and literature may help define the problem and provide guidance.

TACTIC 2 - MITIGATE IMPACT OF CALAMAGROSTIS CANADENSIS

Target Stands:

All harvested areas in BWBS BEC zone

Expected Forest Level Benefits:

Calamagrostis canadensis can significantly reduce stocking and growth potential in regenerating harvested blocks. To ensure adequate basic reforestation is accomplished promptly, a procedure to help rate blocks for their potential for grassing-in is needed. It was estimated that field-testing could occur on 1500 ha per year. The Regional Research Section should be contacted to determine what if any tools are presently available for grass prediction, and what treatment options have been used successfully.

2.4.6.5 RECOMMENDED KNOWLEDGE STRATEGIES

There are many related TSA silvicultural issues not directly addressable via silvicultural practices. Many of these require investigation and further study. Table 2.2.10 identifies, and ranks the importance of 9 Sustainable Harvest knowledge gap issues.

Table 2. **Issues require further investigation**

Knowledge Gap Issues	Rank
Developing silviculture systems for mixedwood stand types.	1
Developing appropriate strategies to resolve conflicts between uses of coniferous and deciduous timber.	2
Explore concept of ledger to track the balance of the coniferous and deciduous land bases.	3
Reach agreement on mixedwood stocking standards.	4
Forest cover re-inventory (VRI and other inventories).	5
Develop aspen planting stock, identify superior aspen clones.	6
Develop methodology for pre-harvest assessment of risk of problems with *Calamagrostis*. The Regional Research Section should be contacted to determine what if any tools are presently available for grass (*C. canadensis*) prediction, and what treatment options have been used successfully.	7
* Improve estimates of OAF 1 and OAF 2 in regenerating stands.	8
* Improve methods for projecting growth and yield of deciduous species, (e.g., through development of MGM), particularly mortality functions in pure, deciduous leading, and mixed stands.	9

2.5 FORT ST. JOHN TSA SUSTAINABLE HARVEST ISSUES AND SILVICULTURAL STRATEGY

This section describes the key sustainable harvest issues in the Fort St. John TSA, and defines a provisional silvicultural strategy to address them. The following strategic analysis is based on a recently completed Type I Silvicultural Analysis, but requires further, detailed forest analysis and modelling to validate and refine underlying assumptions. In the meantime, this strategy is reflected in the proposed, 5 year Sustainable Harvest Plans for the Fort St. John Forest District (Section 2.8).

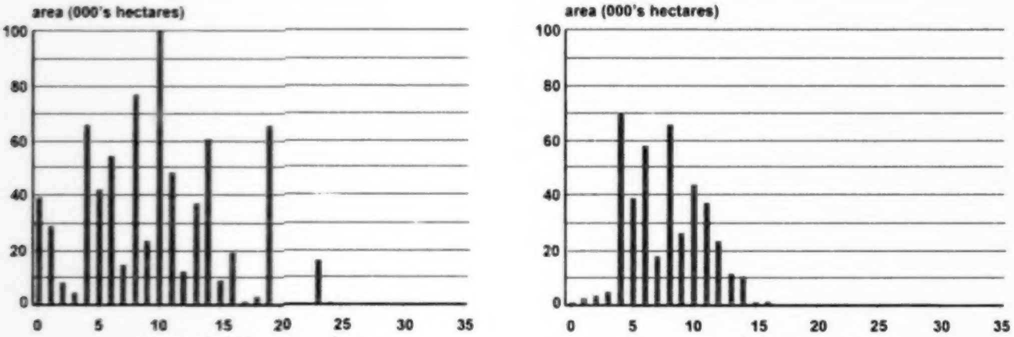
2.5.1 THE RESOURCE LAND BASE

The Fort St. John TSA covers 4 673 049 ha, of which 1 194 000 (25.6%) is considered to be in the timber harvesting land base (THLB).

The site class profile of the THLB is: 20% poor, 65% medium and 15% good site.

The current age class profile of the THLB is skewed toward older age classes, particularly in the coniferous component (Figure 2.5.1).

Figure 2.5.1 **Current age class distribution of the timber harvesting land base, Fort St. John TSA 1995**



Coniferous forest

Deciduous forest

The tree species profile on the THLB is approximately 34% lodgepole pine, 27% spruce, 37% aspen, 1% cottonwood and less than 1% balsam (Figure 2.5.2). Lodgepole pine is the dominant coniferous species. Almost 39% of stands in the THLB are at or above the minimum harvestable age. This mature portion varies by leading species and consists of 41% lodgepole pine, 37% spruce and 38% aspen stands.

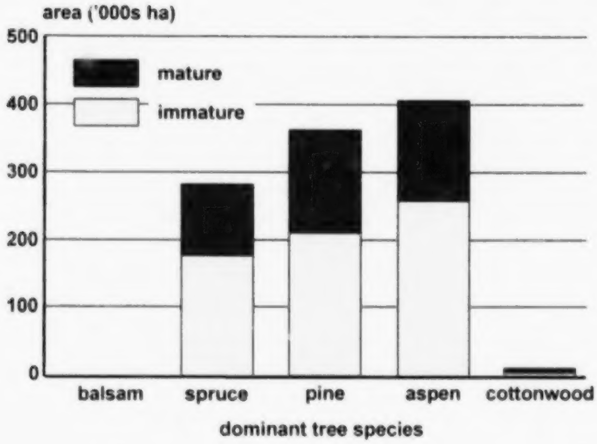


Figure 2.5.2. **Current species composition – timber harvesting land base, Fort St. John TSA 1995**

2.5.2 RESOURCE SUPPLY ISSUES

2.5.2.1 TIMBER SUPPLY – VOLUME

The timber supply analysis for Fort St. John TSA (1995) separated the timber supply forecast into coniferous and deciduous components, and so this section presents timber supply issues for each component separately. Upgrade forest inventories

Coniferous Land Base Issues

Marginal Lodgepole Pine Stands - The base case harvest forecast for the coniferous land base does not decline because the current AAC at the time of the analysis was well below the short-term harvest level. There is substantial timber supply to support the AAC. However there is considerable uncertainty about marginal pine types. Large areas of marginal pine types were included in the timber harvesting land base (THLB) for the timber supply analysis, but it is not clear how much of these stands are actually merchantable. While the area in question affects timber supply, there isn't much that can be done silviculturally to affect it.

Managed Backlog Stands - Of almost 95 000 ha classified as NSR in TSR1, about 52 000 ha (mostly in the coniferous land base) was considered operable and restocked over the first four decades. There is now some uncertainty about how much of this area is actually NSR, how much of it can be rehabilitated, and when.

Curtailment of Herbicide Use - If herbicide use is curtailed in the TSA it is likely that productive sites (comprising about 15% of the THLB) would regenerate to mixed rather than pure coniferous stands. This would reduce the mid- and long-term coniferous harvest levels. Dealing with heavy grass competition and aspen suckering, which are serious regeneration problems in some parts of the TSA, would be more difficult.

Resource Inventory Status - The status of the TSA forest inventory is a major issue facing all stakeholders. The inventory has not been updated for decades, and there is considerable uncertainty regarding its accuracy (conifer and deciduous). Audit investigations for TSR1 were based on a small sample (not statistically valid). Timber supply forecasts are dependent on the quality of the inventory, as is development of a sound silvicultural strategy for the management unit.

Mixedwood Management Objectives - While there is currently little harvesting in mixedwoods, some "coniferous" sites are developing as mixedwoods. Outstanding issues include decision support regarding appropriate management for these sites, particularly reliable yield projections for the deciduous and coniferous components of the stands.

Regeneration Delay - Information is required to validate or correct current estimates of regeneration delay used in timber supply analysis.

Timber/Range Conflicts - Issues related to conflicts between timber management and range management require resolution. These include: quantification of the impact of range use on the THLB; the impact that cattle browsing has on growing stock density and potential yield in deciduous-leading stands; possible opportunities for reducing grazing damage to trees by improving the coordination of cattle management; and integrating aspen regeneration and grass-seeding.

Deciduous Land Base

Deciduous Timber Supply - The base case harvest forecast for the deciduous land base starts at the current AAC, and declines by about 10% per decade to the long-term harvest level.

Deciduous Yield Projection - There are concerns in the district about the accuracy of the deciduous inventory. As harvesting deciduous species increases in the near future, predicting yields for deciduous species will become more important.

Productivity Potential - There is inadequate information regarding site productivity potential of deciduous species.

2.5.2.2 TIMBER SUPPLY – QUALITY

The are no outstanding issues regarding timber quality in the Fort St. John TSA.

2.5.2.3 HABITAT SUPPLY

Natural Disturbance Regimes - The issues relating to fire disturbance regimes and forest management practice in the Fort St. John TSA is similar to that described for the Dawson Creek TSA.

Non Productive Cover Conversion - Areas of non-commercial brush (primarily willow and grass) are being converted to spruce. This often involves heavy reliance on herbicides to control vegetation competition. There may be detrimental effects on the presence and distribution of rare ecosystems.

Wildlife Habitat/Forestry Interaction - Common issues of concern to stakeholders concern the habitat requirements of red-listed species and furbearers, including the maintenance of critical habitat for grizzly bear. There is also uncertainty regarding the potential impacts of silvicultural systems on wildlife habitat

Caribou - The Fort St. John TSA includes four caribou management zones: Kobes Creek, Graham, Hackney Hills, and Milligan Hill. These areas comprise 1.8%, 3.3%, 4.0%, and 12.8% of the timber harvesting land base (THLB) respectively. The impacts of forest management on forage habitats for these herds is not well understood.

2.5.3 SILVICULTURAL PRACTICES

2.5.3.1 SILVICULTURAL HISTORY

Incremental silviculture has not been emphasized in the Fort St. John TSA. Since 1985, priority has been on eliminating NSR and brushing impeded stands.

2.5.3.2 BACKLOG SILVICULTURE

In TSR1, a total of 94 478 ha was classified as NSR in the inventory file, and 51 543 ha of this area was considered to be operable and added back to the THLB. The remaining 42 935 ha were assumed to be inoperable and the result of natural disturbances such as fires, wind, insects and disease.

There is uncertainty regarding the NSR backlog figures used in TSR1. Silvicultural records in 1996 suggested there was only 21 610 ha of NSR (10 875 created by logging, 10 735 ha originating from wildfire). In 1999 approximateoy 14 500 ha of NSR remained. Successfull reforestation of these remaining sites will depend on the availability of silvicultural herbicides.

Much of the fire-origin NSR remaining untreated will be reclassified through photo-interpretation, with undoubtably some areas being reclassified to productive forest status. Most will remain as open range, non-productive cover, or other non-forest classification

2.5.3.3 PRECOMMERCIAL THINNING

There is little or no precommercial thinning (juvenile spacing) done within Fort St. John TSA. Spruce stands are not considered to be candidates for spacing regardless of stocking density. Lodgepole pine stands will be considered for repression spacing only, where densities exceed the legislated maximum density of 10 000 sph, and preference is given to stands in which density exceeds 15 000 sph. In very dense stands a two-pass spacing system may be employed, involving first, mechanical row-thinning, followed by a motor-manual selection thinning. This approach is intended to promote optimum biological response with reduced overall thinning costs.

2.5.3.4 TREE IMPROVEMENT

No genetic gain has been included in either TSR1 or TSR 2, since no class "A" seed will be available for the Fort St. John TSA until 2007. The projected gain from improved seed for the Prince George Region is shown in Table 2.5.1.

Table 2.5.1 Forecast gain in volume from improved seed for the Prince George Region.

Species & Seed Zone	Elevation (m)	Gain from Improved Seed (%) 98-99	99-00	2007-08
Sx PR low	<1200	-	-	23

Source: Forest Genetics Council

2.5.3.5 HERBICIDE USE

Use of forest herbicides is as contentious in Fort St. John TSA as it is in many other management units. Without the judicious use of selective herbicides, however, plantation silviculture would fail at the establishment phase, particularly in backlog NSR conversion.

2.5.4 TSR 1 MANAGEMENT ASSUMPTIONS

In addition to the inventory, assumptions about how it will be managed are essential for determining a silviculture strategy.

2.5.4.1 INVENTORY PROFILE

The inventory profile (species composition) of the THLB will change over time with harvesting and replanting. Table 2.5.3 records the trend in species profile resulting from the harvesting schedule of the TSR base case.

Table 2.5.3 Current inventory profile and conversion trends, Fort St. John TSA 1995

	Percent of area		
Species	**Total**	**Mature[1]**	**Conversion**
Pine	34	41	$P_{85} S_{15}$
Spruce	27	37	S_{100}, or $S_{75}P_{25}$
Aspen	37	38	A_{100}
Cottonwood	1	-	
Balsam	<1	-	
Total	**100**	**100**	

Source: TSR Fort St. John TSA Timber Supply Analysis, 1995

1. above minimum harvestable age

2.5.4.2 MANAGEMENT ZONES AND FOREST COVER REQUIREMENTS

The TSR management zones and their associated forest cover requirements are listed in Table 2.5.4 and the minimum harvest ages are summarized in Table 2.5.5.

Table 2.5.4 Management zones and forest cover requirements, Fort St. John TSA 1995

Management Zone	% THLB Area	Height 1 (m)	Age 1 (yr)	Maximum % area less than Height 1	Height 2 (m)	Age 2 (yr)	Minimum % area older than Age 2
1 Graham caribou habitat	3.3					140	40
2 Kobes Creek caribou habitat	1.8					120	40
3 Hackney Hills Caribou	4.0					100	40
4 Milligan Hills caribou habitat	12.8					40	50
5 VQO – Partial Retention	0.3	5		10			
6 IRM – coniferous	49[1]	3				100	10
7 IRM- deciduous	28[1]	3				80	30 (At)

1. IRM zone comprises 77% of coniferous and deciduous forests. This figure was adjusted *pro rata* using the coniferous (64%) and deciduous (36%) components of the THLB.

Source: TSR1 Fort St. John TSA Timber Supply Analysis 1995, pp 64-68.

2.5.4.3 HARVESTING PRACTICES

The average area harvested annually is about 2600 ha/year, all of it under even-aged silvicultural systems.

Table 2.5.5 Minimum harvestable ages by leading species and site class, Fort St. John TSA 1995

	Site:		
Species	**G**	**M**	**P**
B	80	80	130
S	80	100	130
Pl	70	80	100

Source: Fort St. John TSA Timber Supply Analysis 1995, p64.

2.5.5 TIMBER SUPPLY DYNAMICS AND THE AAC – CONIFEROUS GROWING STOCK

The 1995 TSR, upon which the current AAC determination was based, suggests that the coniferous timber supply in Fort St. John TSA is capable of supporting a non-declining harvest level of 1.76 million m^3/yr (Figure 2.5.3). This harvest level is 95% higher than the current AAC of 900 162 m^3/yr. The projected increase in the coniferous timber supply relative to the current AAC is due primarily to the inclusion of marginal pine stands previously not contributing to the timber supply.

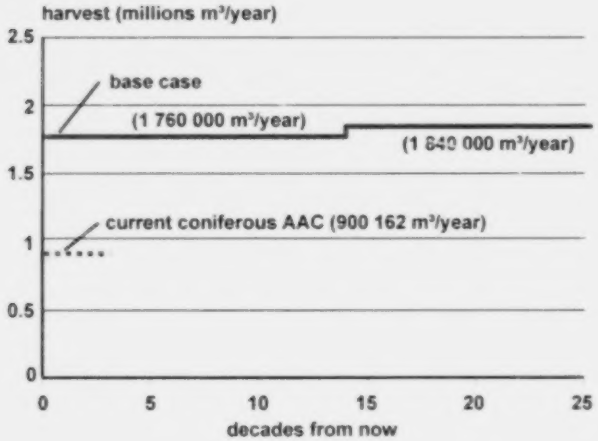


Figure 2.5.3 Coniferous base case harvest forecast, Ft. St. John TSA 1995

A significant portion of the existing coniferous forest is older than minimum harvestable age (Figure 2.5.1). There is currently a total of about 131.47 million m^3 of coniferous volume on the THLB, and of that, about 110.25 million m^3 (84%) is old enough for harvest (Figure 2.5.4). Both the total and harvestable timber inventory decline over the first 100 years before reaching a steady level. An even growing-stock level signifies that timber is being harvested at the productive capability of the land.

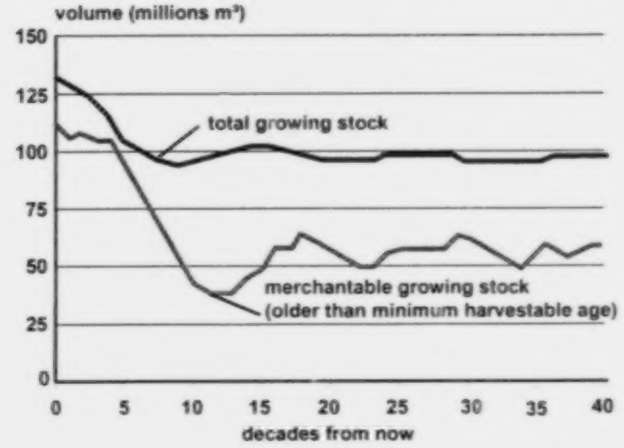


Figure 2.5.4 Growing stock inventories, coniferous base case, Fort St. John TSA 1995

The average age of stands harvested in the base case harvest forecast declines from about 175 years in the short term to about 100 years in the very long-term (Figure 2.5.6). Over the first 150 years, the harvest is taken almost exclusively from the older existing stands of timber. Regenerated stands are harvested near the minimum harvestable ages.

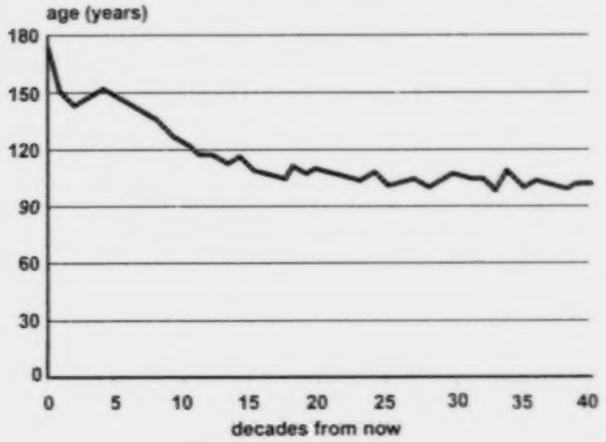
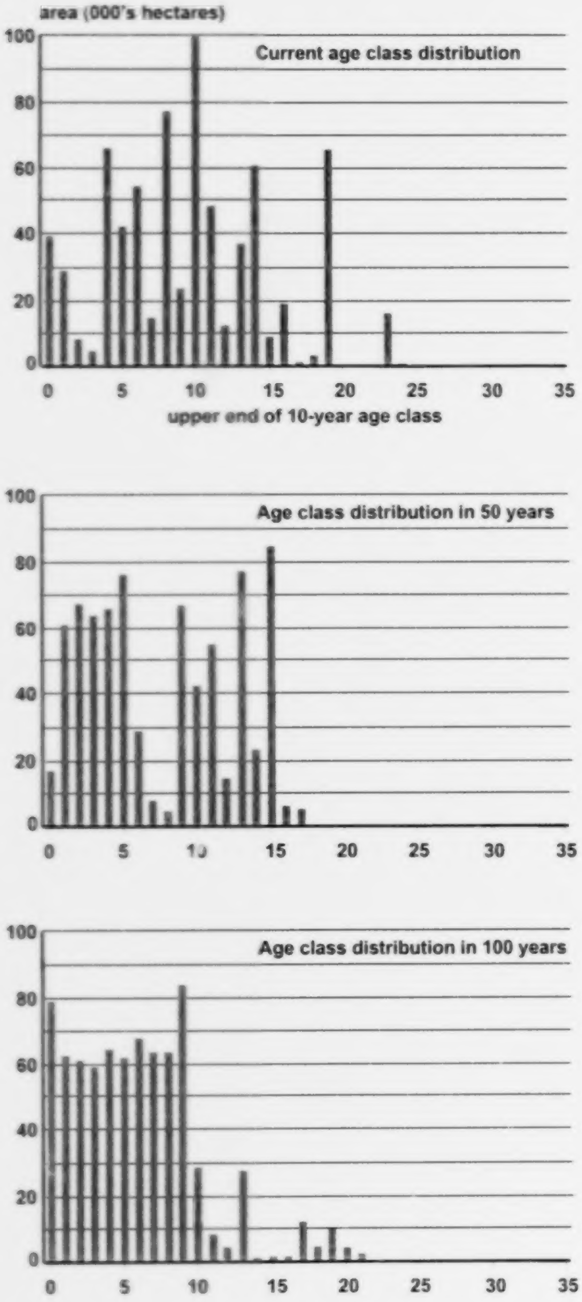


Figure 2.5.5 Average age of harvested stands over time, coniferous base case, Fort St. John TSA.

2.5.5.1 TRANSITION FROM NATURAL TO MANAGED STANDS

Figure 2.5.6 displays the age class distributions of the THLB today, in 50 years, and in 100 years. The majority of the current age class distribution ranges from 90 to 130 years. As this mature timber is harvested, younger age classes can mature, and regenerating harvested mature stands can develop until they reach or exceed minimum harvestable ages.

Figure 2.5.6 Age class distribution over time, coniferous base case Fort St. John TSA



2.5.5.2 NON-DECLINING HARVEST LEVEL EFFECTS

With the inclusion of additional land base (marginal pine stands) in the THLB, the harvest forecast can begin well above the pre-TSR1 AAC and still be non-declining. Without the non-declining harvest flow constraint, a higher harvest could be maintained in the short-term, with the long-term harvest level reached in about 140 years (Figure 2.5.7). This higher rate of harvest in the short term is achieved by harvesting the existing inventory of mature coniferous timber more rapidly than in the base case. The alternative harvest flow shows that a harvest of 2.15 million m^3/yr, approximately 22% higher than the base case harvest forecast, can be maintained for one decade. The dip below the base case harvest forecast in decade 10 is a result of the adjacency or old-growth forest cover requirements limiting the availability of stands for harvest.

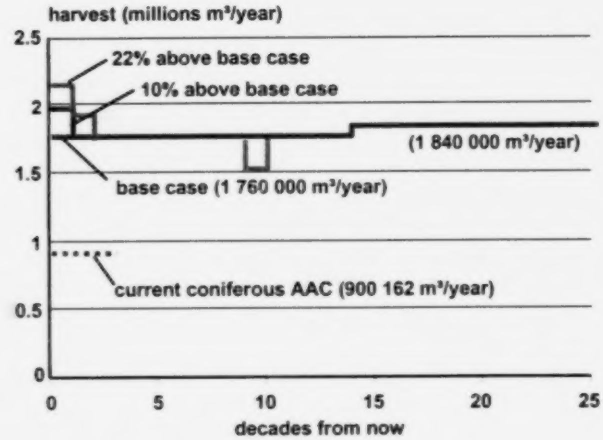


Figure 2.5.7 Alternative harvest flows using the coniferous base case, Fort St. John TSA

2.5.5.3 INCREASING STAND YIELDS

Changing existing-stand yields causes significant change in the initial harvest level (Figure 2.5.8). Changing the yields for regenerated stands has no effect on the initial harvest level.

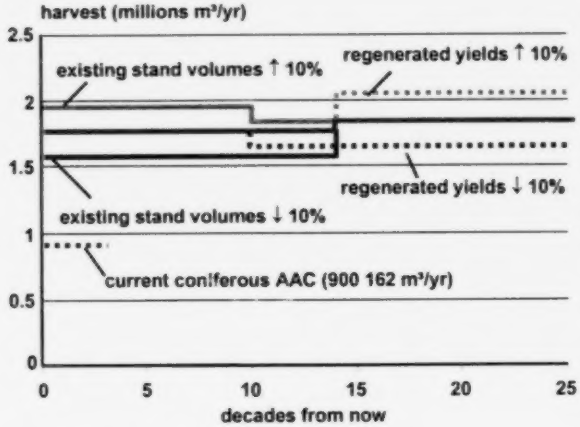


Figure 2.5.8 Coniferous harvest forecasts with stand yields changed by 10%

2.5.6 TIMBER SUPPLY DYNAMICS AND THE AAC – DECIDUOUS GROWING STOCK

The deciduous harvest forecast based on current forest management assumptions for the Fort St. John TSA indicates that the current AAC of 915 000 m^3/yr from deciduous stands can be maintained for 20 years. After that point the volume harvested must be reduced by 10% per decade (to 635 000 m^3/yr) to avoid severe drops below the long-term level (Figure 2.5.9).

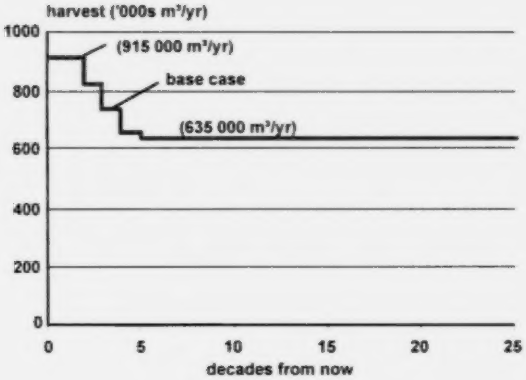
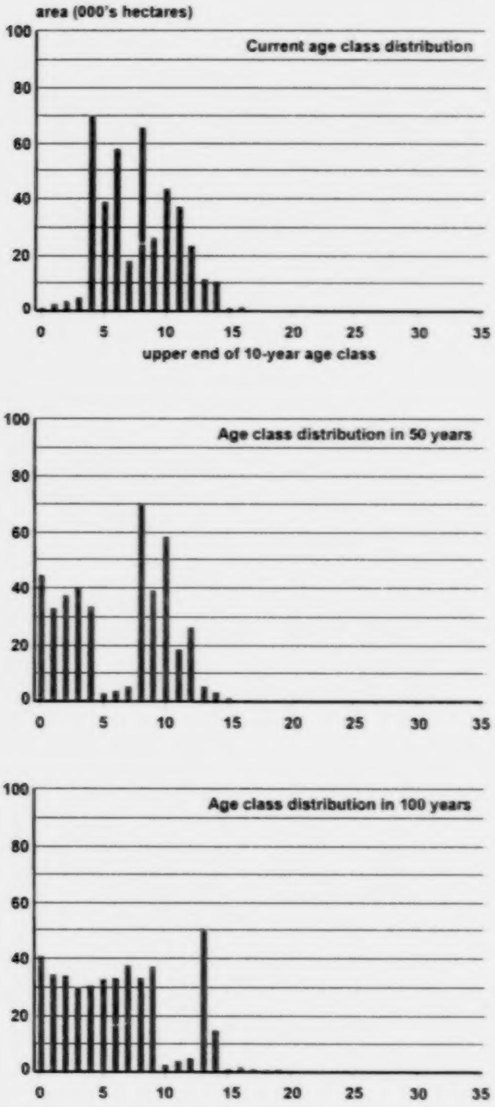


Figure 2.5.9 **Deciduous base harvest forecast, Fort St. John TSA**

2.5.6.1 TRANSITION FROM NATURAL TO MATURE STANDS

Figure 2.5.10 displays the deciduous age class distribution of the THLB currently, in 50 years, and in 100 years. Most of the area of deciduous forest is between 80 and 140 years old. At these ages aspen and cottonwood reach culmination of mean annual increment (MAI), and the incidence of decay increases significantly after about 120 years. Therefore, an important consideration in managing deciduous stands is to harvest older stands before significant volumes are lost to decay.

Figure 2.5.10 Stand age class distribution over time, deciduous base case Fort St. John TSA 1995



2.5.6.2 SCARCITY OF HARVESTABLE TIMBER IN LATE MID-TERM

Figure 2.5.11 illustrates the gradual decline in the available growing stock for the first 50 years.

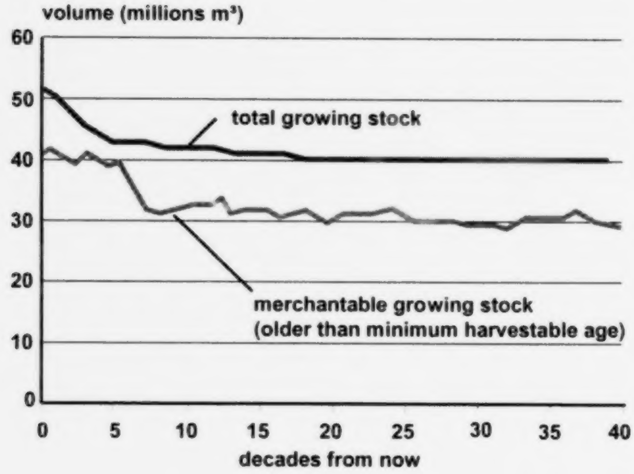


Figure 2.5.11 **Total and available growing stock, deciduous base case, Fort St. John TSA 1995**

2.5.6.3 RATIONING OF CURRENT MATURE TIMBER

Figure 2.5.12 shows alternative harvest flows that ration out the stock of existing mature timber at different rates than in the base case. In the first alternative harvest flow, the initial harvest is 9% higher than in the base case forecast, but declines slightly more steeply. The reason for this decline is the depletion of mature harvestable stands before regenerating stands have reached the minimum harvestable age. The harvest level evens out as the balance between regenerating and mature stands is reached.

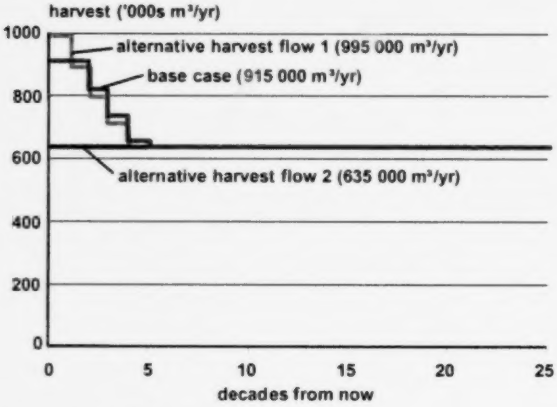


Figure 2.5.12 **Alternative harvest flows using the deciduous base case, Fort St. John TSA**

2.5.6.4 INCREASING STAND YIELDS

Figure 2.5.13 shows the effect on the deciduous harvest forecast of increasing stand volumes for existing and regenerated stands by 10% (the same yield tables were used for existing and regenerated stands). The current allowable harvest level can be maintained for 30 years then declines by 10% per decade to the long term harvest level. If the stand volumes are decreased by

10%, the initial harvest level is decreased and declines after the first decade by 10% per decade to the long term harvest level.

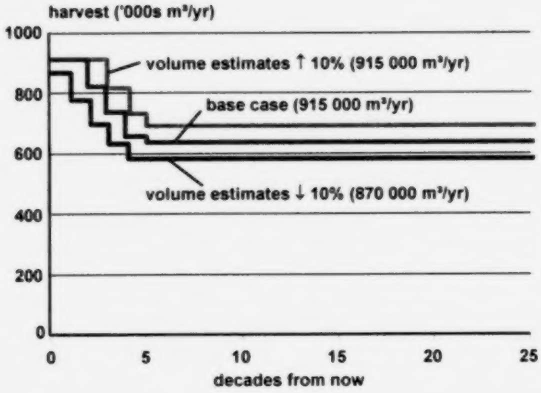


Figure 2.5.13 **Deciduous harvest forecast with yield estimates +/- 10%**

INCREASING THE TIMBER HARVESTING LAND BASE

A review of 280 sample plots used to calibrate Variable Density Yield Prediction (VDYP) may be underestimated by an average of 15% due to decay, waste and breakage factors. The THLB could be larger; fewer stands would be deducted due to low site productivity or volume. Figure 2.5.14 examines the effects of increasing both volume and land base.

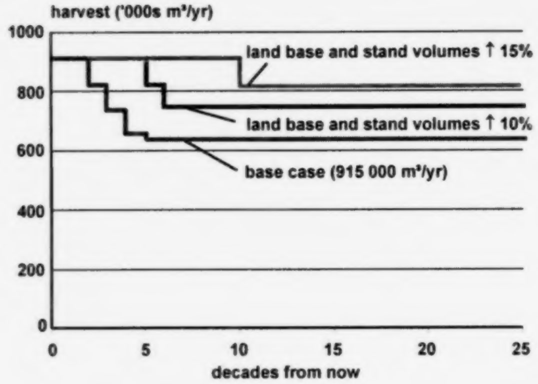


Figure 2.5.14 **Deciduous harvest forecast with volume estimates and land base increased by 10% and 15%**

2.5.7 TIMBER SUPPLY DYNAMICS - SUMMARY

The Fort St. John TSA is separated into coniferous and deciduous components for timber supply analysis and AAC determination. The harvest forecast for the coniferous forest is flat, indicating that there is little harvesting pressure on the unit in the short term, and that the abundance of existing mature timber buffers the harvest forecast against changes in data or assumptions. This means that there aren't many opportunities for manipulating timber supply by applying silvicultural activities. Neither changing minimum harvestable age (MHA) nor increasing yields for regenerated stands has any short-term effect on timber supply.

Timber supply on the coniferous forest is sensitive to changes in the THLB, about which there are two sources of uncertainty. First is the inclusion of a large area of marginal (small) pine stands. There is some question about how much of these pine stands are truly merchantable. Secondly, there is a significant amount of backlog NSR that was scheduled for rehabilitation in TSR1. There is uncertainty about how much of this backlog can be successfully rehabilitated on the one hand, and how much might be incorrectly classified on the other hand. If the use of herbicides is curtailed, rehabilitation of NSR will be more challenging, and regenerating high site index coniferous stands to pure conifer may be difficult or impossible.

The base case forecast for the deciduous forest shows that the current AAC can be maintained for only two decades, after which it must decline by 30% over four decades to the long-term harvest level. The short-term deciduous harvest was slightly sensitive to two factors: yields for existing and regenerated stands, and regeneration delay. It may be possible to define some silvicultural strategies to utilize this sensitivity to affect short-term harvest levels. However it is only recently that the actual level of harvesting in the TSA is approaching the supply forecast levels.

2.5.8 KEY ISSUES AND POTENTIAL SILVICULTURAL STRATEGIES

This section identifies the key Sustainable Harvest issues facing the TSA, as well as potential silvicultural strategies considered suitable to address them. Of those resource supply issues described in Section 2.5.2, two are considered key by management unit stakeholders:

- How can the coniferous and deciduous timber harvesting land base be expanded or maintained in the TSA?
- How can the expected fall down in the decidous harvest be mitigated?

Both these issues are directly addressable through specific silvicultural strategies and tactics, summarized, with relative stakeholder priority, in Table 2.5.6.

Table 2.5.6 Key issues and possible silvicultural strategies and tactics for the Fort St. John TSA.

Key Issues	Silvicultural Strategies	Silvicultural Tactics	Opportunity Area (ha/yr)	Stakeholder Priority
Maintain or Enhance the THLB	NSR Reclassification	photo interpretation	10 000	1
		ground surveys	2000	1
	NSR Reforestation	site preparation	200	1
		planting	400	1
		manual brushing	900	1
		herbicide brushing	400	1
		surveying	1600	1
	Surveys	low productivity sites	?	2
		non-merchantable stand types	?	2
		NC Br (recce survey)	200	3
		old oil and gas roads and well sites	400	4
Mitigate Fall-down of Deciduous Harvest	Aspen management	fill-plant, or herbicide/plant improved aspen genotypes	250	5

The forest level impacts of each stategy and tactic are estimated in Table 2.5.7. This set of strategies must be considered provisional at this time; they must be analysed and evaluated in further forest estate modelling. Most importantly, the resource inventory on which they are based must be updated to ensure the current state of the forest is accurately described. If this is not done, apparent issues and possible strategic solutions could be misleading. In the meantime, and for this RMP, local technical expertise, current policies and present uncertainties surrounding some of the following strategies are reflected in the SH investment recommendations for the Fort St. John District.

2.5.8.1 ISSUE 1: MAINTAIN OR EXPAND THE TIMBER HARVESTING LANDBASE

STRATEGY 1-1 RETIRE NSR BACKLOG

Possible Tactics

Identify NSR versus non-NSR, using photo interpretation in concert with ground-truthing.

Classify NSR that is deciduous leading.

Reforest stands that require it. Check stocking of deciduous-leading stands–where adequately stocked, consider shifting the block to a deciduous polygon for future timber supply analyses.

Target Stands

Stands currently classified as NSR in ISIS, both harvested and otherwise.

Expected Forest Level Benefit

This will maintain the landbase currently assumed in the (base case projections depends upon it).

Presently there is no falldown indicated for the coniferous timber supply, yet one is indicated for the deciduous timber supply (assuming the cut is achieved in the short-term). Accepting NSR stands stocked with deciduous species would increase the deciduous supply and decrease coniferous supply in the mid-term and long-term.

STRATEGY 1-2 INCREASE THE TIMBER HARVEST LANDBASE THROUGH CONVERSION OF OLD AGRICULTURAL LAND

Possible Tactics

To implement this strategy there needs to be an agreement with Crown Lands over jurisdiction. A paper describing the benefits of afforestation or range use is needed. The justification of including the land in the THLB could be in the form of jobs or animal unit months (AUMs).

Target Stands

Crown lands within the TSA.

Table 2.5.7 Key Issues, possible strategies and potential tactics with forest level impacts, Fort St. John TSA

	Issues	Objectives	Strategies	Target	Activities	Opportunity Area (Ha/Yr)	...... Timber Supply Effects ...... Short	Mid	Long	Qual	Habitat Effects	Jobs Days/ha	Cost $/ha	Rank
1	Maintain or increase timber harvesting land base	Retire backlog NSR	identify NSR/non-NSR	Area currently classified NSR on FC1	Photo interpretation reclassification - false color IR	10000		+	+	0				1
			classify NSR (decid-leading, conifer-leading, productivity)	NSR in ISIS database	- ground surveys	2000		+	+				36	1
			reforest backlog NSR	harvested NSR in ISIS	site prep	200		+	+		+/-		1000	1
					plant	400		+	+		+/-		900	1
					manual brushing	900		+	+		+/-		850	1
					herbicide brushing	400					+/-		400	1
					survey	1600		+	+		+/-		36	1
2		Manage abandoned agricultural land	afforest old agricultural land - substitute lands for range use	Crown lands in TSA - ALR lands that have reverted to Crown	- pursue agreement with Crown Lands - identify old agricultural land suitable for afforestation or range use	250		+	+		+/-		4	3
3		Afforest oil and gas lands	afforest oil and gas access roads, facilities, and well sites that are no longer used	oil industry roads and well sites	- identify lands from Oil and Gas Commission database - survey, determine total treatable area	800		+	+		+		4	4
					prep and plant	400		+	+		+		3500	
4		Utilize "low productivity" lands	Classify "low productivity" lands as treatable, non-treatable, not "low", utilize productive sites	area classified as "Low Productivity"	identify area in FC1 (check TSR criteria) - survey - classify	?		+	+					2
			Classify non-merchantable stands	area classified as "non-merchantable"	identify area in FC1 (check TSR criteria) - survey - classify	?		+	+					2
					treat	0, 300, 300		+	+		+/-		3186	2
5		Utilize "low productivity" lands	Assess and treat NC Br	areas of NC Br accessed since FRDA conversions (e.g., Tommy Lakes)	- recce survey - landscape-level plans -select areas for treatment	200		+	+		+/-		4	3
6	Falldown in deciduous harvest forecast	Mitigate deciduous harvest falldown	Classification of deciduous stands recognizing differences btwn aspen clones	aspen-leading stands across TSA within 150 km of Fort St John	- tools/decision tree to assess individual stand - aging and assessing - design management regimes for different classes of aspen clone - assess timber supply implications	within 150 km of Fort St. John	+	+	+				10	3
					harvest stands that are decaying and below present MHA	<250 ha	+				+/-			
			Use artificial regeneration techniques for aspen	harvested areas with inadequate aspen re-stocking	- further development of stock types, nursery procedures - developing site-specific prescriptions for establishment	<250 ha		+	+	+	+/-			5
				areas harvested in 6, above	fill-plant, or herbicide and plant to establish improved genotype on site	<250 ha		+	+	+	+/-		1800	5

KEY TO RANKS

1 NSR is highest priority because base case depends on it
2 items that contribute to land base immediately were given high priority
3 bringing non-contributing lands into THLB
4 dispersed, high cost, questionable return on investment
5 long-term benefits

Expected Forest Level Benefit

Bring more land into the THLB to increase harvest levels in the long term, and potentially in the short- and mid-term, depending upon the status of the land–some hectares may be presently stocked with merchantable or nearly merchantable deciduous stems.

STRATEGY 1-3 AFFORESTATION OF OIL AND GAS INDUSTRY ACCESS ROADS, FACILITIES AND WELL SITES THAT ARE NO LONGER IN USE

Possible Tactics

Create treatment regimes based on present status (cover and history). Identify potential areas, survey to determine total treatable area and treat accordingly.

Target Stands

Suitable lands from Oil and Gas Commission database.

Expected Forest Level Benefit

Bring more land into the THLB to increase harvest levels in the long and potentially short and mid term, depending upon the status of the land (some may be stocked with merchantable or nearly merchantable deciduous).

STRATEGY 1-4 CLASSIFY "LOW PRODUCTIVITY" LANDS AS TREATABLE, NON-TREATABLE AND NOT "LOW"

Possible Tactics

Bring not-low hectares back into the THLB, treat treatable lands where appropriate, update the inventory with accurate figures for "low-productivity" and non-treatable "low productivity" lands.

Identify potential areas, survey to determine total treatable area and treat accordingly. This will require a comprehensive sampling methodology (some 275,000 ha to assess), a set of criteria for "low productivity", a set of criteria for "treatable", a set of regimes appropriate for "treatable" sites and a mechanism to update the database with the revised values. Once the treatable area and the regimes have been identified, the impact of treatment and desirability of implementing the plan can be determined based on the forest-level effects

Target Stands

Areas classified presently as "low productivity". Identify areas in FC1. Use most recent TSR to check for criteria for "low productivity".

Expected Forest Level Benefit

Bring more land into the THLB to increase harvest levels in the short-, mid- and long-term.

STRATEGY 1-5 RECLASSIFY STATUS OF NON-MERCHANTABLE STANDS

Possible Tactics

Create classes to better define merchantability, i.e., volume categories (e.g., > 140 m^3/ha, 100 to 140 m^3/ha, 70 to 100 m^3/ha, < 70 m^3/ha or some sliding scale organized by distance to processing locations - less volumes closer to center).

Identify non-merchantable polygons in the inventory. Sampling will require a comprehensive sampling methodology (some 306,000 ha to assess), a set of criteria for non-merchantable (or categories as described above needs to be created) along with a mechanism to update the database with the revised values.

Target Stands

Areas classified as non-merchantable. Identify areas in FC1. Use most recent TSR to check for criteria for "non-merchantable".

Expected Forest Level Benefit

Bring more land into the THLB to increase harvest levels in the short-, mid- and long-term.

STRATEGY 1-6 CLASSIFY AND TREAT SUITABLE NC BRUSH (NC BR)

Possible Tactics

Identify potential areas, survey to determine total treatable area and treat accordingly.

Target Stands

Areas of NC Brush in newly roaded (last 5 years) areas. Target areas not available during FRDA period (e.g., Tommy Lakes).

Expected Forest Level Benefit

Bring more land into the THLB to increase harvest levels in the long term.

2.5.9 ISSUE 2: FALLDOWN IN DECIDUOUS HARVEST FORECAST

STRATEGY 2-1 IMPROVE DECIDUOUS INVENTORY AND PRODUCTIVITY

Possible Tactics

The present accuracy of the deciduous inventory is uncertain. Audit investigations for TSR 1 were based on too small a sample size to be statistically valid. Therefore a larger sample size is needed to provide accurate deciduous volume estimates.

While TSR 1 did not indicate a problem with site index estimates, there is uncertainty regarding deciduous productivity estimates. It is suggested that productivity be estimated at the time of field sampling. An example methodology is described by Chen et al (1998[9]) to assess aspen productivity based on ecological factors.

Target Stands

Within 150 km of Ft. St. John.

Expected Forest Level Benefit

More accurate volume estimates and growth potential for aspen leading stands. Better forecasting for deciduous timber harvest.

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[9] Chen, H.Y.H., K. Klinka and R. Kabzems. 1998. Site index, site quality, and foliar nutrients of trembling aspen: relationships and predictions. Can. J. For. Res. 28: 1743-1755.

STRATEGY 2-2 EXPLORE MIXEDWOOD MANAGEMENT

Possible Tactics

Follow-up with present strategies and research initiatives such as those being explored in the Fort Nelson TSA and elsewhere (e.g., Alberta). Beware of the limitations of present information when modeling mixedwood treatments. Additional field study, operational trials, and adaptive experimental management are needed to determine suitable options for mixed wood management[10].

Propose and implement suitable mixedwood harvesting strategies in the TSA, monitor results. Work with modelers to help assess timber supply implications.

Target Stands

Within 150 km of Ft. St. John.

Expected Forest Level Benefit

Use of existing mixedwood structures to utilize both deciduous and conifer volumes. Studies have shown significant spruce release after aspen overstorey removal[11]. Possible increase to deciduous long term harvest level, depending upon implementation.

STRATEGY 2-3 DESIGN MANAGEMENT STRATEGIES BASED ON CLONE PRODUCTIVITY. EXAMINE THE SUITABILITY OF THE MINIMUM HARVEST AGE AS BEING USED IN THE TSR.

Possible Tactics

Through updated inventory information identify "underachieving" clones. Where clones are not well suited to the site (i.e., early rot), harvest prior to the minimum harvest age (MHA) to capture present volume. To increase the productivity of these sites artificial reforestation (either aspen or conifers) should be considered.

Target Stands

Within 150 km of Ft. St. John (decaying stands that are below the MHA).

Expected Forest Level Benefit

Utilize present volumes before additional decay reduces their volume and value further. Reforest with suitable stock to promote better site utilization.

STRATEGY 2-4 REFINE ARTIFICIAL REGENERATION TECHNIQUES FOR ASPEN

Possible Tactics

Further development of stock types and nursery procedures is required. Development of site-specific regeneration prescriptions (e.g., density, microsite location) is also needed.

Explore aspen fertilization (watching for understory effects versus aspen response).

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[10] Barrie Phillips memo to the Chief Forester Regarding: Slocan FRBC Project Report "Forest Estate Planning in the Boreal Mixedwood:. October 8, 1999.

[11] Yang, R.C. 1991. Growth of white spruce following release from aspen competition: 35 year results. For. Chron. Vol. 67. No. 6, 706-711.

Man, R. and V. J. Lieffers. 1999. Are mixtures of aspen and white spruce more productive than single species stands? Forestry Chronicle, Vol. 75, No. 3, 505-513.

Target Stands

Within 150 km of Ft. St. John (decaying stands that are below the MHA).

Expected Forest Level Benefit

Reforest aspen in areas of poor quality clones. Allow more flexibility in reforestation of aspen and increase future aspen quantity and quality.

The forest level impacts of each stategy and tactic are estimated in Table 2.4.9. This set of strategies must be considered provisional at this time; they must be analysed and evaluated in further forest estate modelling. Local technical expertise, current policies and present uncertainties surrounding some of the following strategies are reflected in the SH investment recommendations.

2.5.9.1 RECOMMENDED KNOWLEDGE STRATEGIES

There are many related TSA silvicultural issues not directly addressable via silvicultural practices. Many of these require investigation and further study. Table 2.2.10 identifies, and ranks the importance of 9 Sustainable Harvest knowledge gap issues. These issues and knowledge gaps are discussed subsequently

1. UPGRADE FOREST INVENTORIES

There are concerns regarding the accuracy of the forest inventory, and in particular about the estimates of deciduous volumes. Audit investigations for TSR1 were based on a small sample (not statistically valid). Timber supply forecasts are dependent on the quality of the inventory. Undertaking a pre-inventory analysis (PIA) to assess the current inventory is recommended as a first step.

2. EXPLORE REGENERATION DELAY

Some empirical data is needed to validate or correct current estimates of regeneration delay used in timber supply analysis.

3. REFOREST AND MAINTAIN STOCKING OF BACKLOG

There is some uncertainty, or lack of confidence that reforested backlog hectares will remain adequately stocked. Survey evidence is needed.

Table 2.5.8 Issues requiring further investigation, Fort St. John TSA

Item	Issue requiring further investigation	Rank
1	Upgrade forest inventories (investment strategy depends on it, as do future timber supply analyses); begin with Pre-Inventory Analysis	1
2	Explore regeneration delay	1
3	Reforest and maintain stocking of backlog	2
4	Improve prediction of future yields	3
5	Improve decay, waste and breakage factors	4
6	Understand habitat requirements for: red-listed species (e.g., warblers), furbearers,	4
7	Develop strategies about impacts of silvicultural systems on wildlife habitat	5
8	Develop mixedwood management strategy	6
9	Quantify the impact of range use on THLB and timber supply	7
10	Improve range/cattle management	7
11	Minimize tree-grass-cattle conflicts through IRM	7
12	Integrated aspen regeneration and agronomic seeding—include input from licensees and MELP	7
13	Look into findings of 1999 grizzly bear study	8
14	Develop artificial regeneration techniques for aspen	9
15	Explore effect of fertilizing aspen	10

4. PREDICTION OF FUTURE YIELDS

There is a noticeable lack of information about the productivity of deciduous stands, and about estimates of site productivity for deciduous species. It may be possible to estimate site productivity for aspen using an approach based on ecological factors (e.g., Chen *et al*, 1998[12]).

5. WILDLIFE HABITAT

There is a need for better information regarding the habitat requirements of red-listed species, furbearers, Grizzly Bear and Caribou, and the impacts of forest management practices on these species.

6. DEVELOP MIXEDWOOD MANAGEMENT STRATEGY

While there is little harvesting in mixedwoods today, some "coniferous" sites are developing as mixedwoods. Issues include appropriate management for these sites, and developing yield projections for the deciduous and coniferous components of the stands. Follow-up with present strategies and research initiatives such as those being explored in the Fort Nelson TSA and elsewhere (e.g., Alberta). Additional field study, operational trials, and adaptive management experiments are needed to determine suitable options for mixed wood management[13]. Some studies have shown significant spruce release after aspen overstorey removal (e.g., Yang, R.C. 1991, Man and Lieffers, 1999[14]).

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[12] Chen, H.Y.H., K. Klinka and R. Kabzems. 1998. Site index, site quality, and foliar nutrients of trembling aspen: relationships and predictions. Can. J. For. Res. 28: 1743-1755.

[13] Barrie Phillips memo to the Chief Forester Regarding: Slocan FRBC Project Report "Forest Estate Planning in the Boreal Mixedwood:. October 8, 1999.

[14] Yang, R.C. 1991. Growth of white spruce following release from aspen competition: 35 year results. For. Chron. Vol. 67. No. 6, 706-711.

7. CONFLICTS BETWEEN TIMBER AND RANGE MANAGEMENT

A number of issues related to conflicts between timber management and range management were identified as needing investigation. These include quantifying the impact of range use on the THLB and the browsing effect on stocking density and potential yield in deciduous-leading stands; possible opportunities for reducing grazing damage to trees by improving the coordination of cattle management; and integrating aspen regeneration and grass-seeding.

Man, R. and V. J. Lieffers. 1999. Are mixtures of aspen and white spruce more productive than single species stands? Forestry Chronicle, Vol. 75, No. 3, 505-513.

2.6 FORT NELSON TSA SUSTAINABLE HARVEST ISSUES AND SILVICULTURAL STRATEGY

This section describes the key sustainable harvest issues in the Fort Nelson TSA, and defines a provisional silvicultural strategy to address them. The following strategic analysis is based on a recently completed Type I Silvicultural Analysis, but requires further, detailed forest analysis and modelling in the Type II analysis. In the meantime, this provisional strategy is reflected in the proposed, 5 year Sustainable Harvest Plan for the Fort Nelson Forest District (Section 2.8).

2.6.1 THE RESOURCE LAND BASE

The Fort Nelson Timber Supply Area is the second largest timber supply area in the province, covering more than 9.7 million hectares. It is bordered on the east by Alberta, on the north by the Northwest and Yukon Territories, on the west by the summit of the northern Rocky Mountains and the Bulkley/Cassiar Forest District, and on the south by the Fort St. John and Mackenzie Forest Districts.

The eastern part of the timber supply area, nearest the Alberta border, is an extension of the Great Plains (or Alberta Plateau). In the southern part of the timber supply area, these plains grade into the foothills of the northern Rocky Mountains at the western boundary of the timber supply area. In the northern portion, the plains grade into the Liard River basin and the Liard Plateau.

The TSA boundary has been recently amended, adding about 1.5 million hectares which was previously part of the Cassiar TSA, will be added to the Fort Nelson TSA. The area added to the Fort Nelson TSA is remote and not expected to contribute significantly to timber supply over the next several years. However, it will contribute to other resource values of the Fort Nelson TSA. The contribution of the additional area and its impact on the Fort Nelson TSA timber supply, if any, will be examined in the next timber supply review.

Approximately half of the Fort Nelson TSA is considered productive forest area (about 4.2 million hectares). Currently 28% of that productive forest is considered available for harvesting.

The site class profile of the timber harvesting land base is: 35% poor, 54% medium, 9% good site, and 1% low productive site (RMP).

The current age class distribution of the Fort Nelson TSA forest land base is illustrated in Figure 2.6.1. Within the timber harvesting land base, a substantial portion of stands are in mature (28%) or old (36%) seral stages. About 6% of stands are early seral, reflecting the frequent fire disturbance of the TSA.

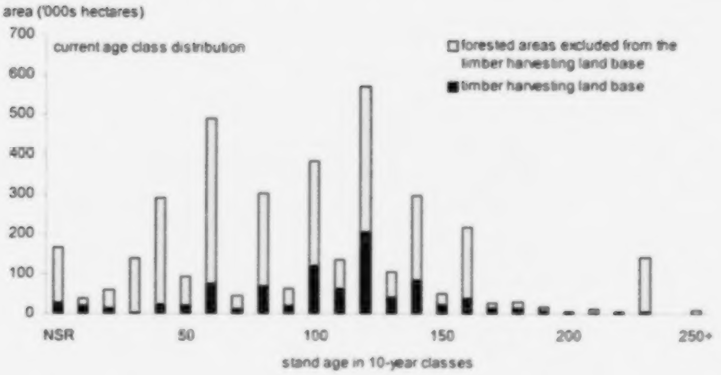

Figure 2.5.1 **Age class distribution in the Fort Nelson TSA.**

The tree species distribution in the TSA is apprriximately 43% white spruce, 20% Lodgepole pine, 29% aspen, 5% birch and 3% cottonwood.

2.6.2 RESOURCE SUPPLY ISSUES

2.6.2.1 TIMBER SUPPLY – VOLUME

Mixedwood Management Guidelines - Mixed species stands have not been widely utilized in the Fort Nelson TSA. Development of coniferous and deciduous facilities in Fort Nelson has led to increased interest in mixedwood stands. The District has developed an interm mixedwood strategy but there is uncertainty about the dynamics of mixedwood stands. Silviculture stand management techniques for mixedwood stands are currently under development.

Potential Productivity Losses on Backlog Sites - ISIS currently lists 11,000 ha of backlog NSR. Of this, approximately 2,500 are deemed untreatable due to regeneration problems or other constraints, and a further 2,500 ha are known or estimated to be stocked. There remains approximately 6,000 ha to be treated, spread out in a mosaic pattern over the entire THLB. It is estimated that 30% will be mechanically site prepared and planted, and 70% will be chemically site prepared and planted. Assuming an average cost of $1600/ha to site prepare and plant these areas, the total budget to complete this work is estimated at $9.6 million.

In addition to Backlog NSR reforestation needs, many stocked backlog stands require vegetation management. For the entire area of backlog (30 000 ha) it is estimated that 25% needs no treatment, 60% need one brushing treatment, and 15% needs two brushing treatments. It is also assumed that 70% of brushing treatments will use herbicides, while the other 30% will be manual. Given two treatments on some areas, and the need for brushing maintenance on regenerated NSR stands, it is estimated that 25 800 ha of treatment is required for full achievement of free growing on all backlog sites. Assuming $400/ha for chemical treatments and $1400/ha for manual treatments, the total budget required for brushing backlog areas is anticipated to be $25.8 million.

Small Scale Salvage Program - The estimated annual loss (TSR) to Spruce beetle, Spruce budworm, and fire on the total land base is 484 569 m^3 per year. Annual salvage of this lost amount is 58 173 m^3 per year. Blowdown loss in mature stands needs to be estimated. Development of a substantial salvage program would increase timber supply

Budworm Infestation - Many stands, including young plantations, mixedwood stands, and pure spruce stands in this TSA were heavily attacked by budworm during the last 10 years. It was estimated that 1.1 million hectares was affected by a 1999 attack. Improved forest health maintenance projects and increased salvage programs could potentially increase timber supply.

Incremental Silviculture - Due to the late start of harvesting in the Fort Nelson TSA there is no incremental silviculture history. However reforestation of all backlog sites in 10 years and conversion of 2 500 hectares of non commercial brush over the next 10 years will be incorporated in the TSR2 analysis.

Herbicide Use - Herbicide availability will affect future yields and delays in establishment that can affect timber quantity and quality. In many stands with Calamagrostis Canadensis aerial application of herbicide is the only option.

Integrated Resource Management - Since TSR1 new administrative constraints brought about by the Forest Practices Code (FPC) and TSA management decisions have impacted timber supply. The following is a list of identified impacts:

- Declaration of additional visual quality objectives.
- Changes in green-up requirement.
- Landscape unit planning.
- Wildlife trees (WT) and tree patches (WTP) retention.
- Exclusion of the recommended LRMP proposed protected area from the timber harvesting land base.
- Eight backlog blocks (314 hectares) are included in the new Klua Lakes protected area. The treatment of these areas will be deferred until a management plan is prepared by BC Parks.
- The inclusion of Paper birch-leading stands (SI>17) in the AAC.

Soil Compaction – Summer LoggingIn order to keep the oriented strand board (OSB) plant operating, Slocan is targeting aspen stands for summer harvesting. The Fort Nelson TSA is comprised of stands with fine textured soils – high harvesting disturbance. The following are possible consequences of harvesting on these sites:

- Increased soil disturbance (all roads are declared permanent).
- Lack of natural regeneration of aspen on compacted sites.
- Permanent loss of productive sites (access, roadside-processing areas).

Stocking Standards - Currently, the Fort Nelson TSA is managing to meet minimum stocking standards instead of targets. The TSA is reestablishing riparian areas through increased stocking and various vegetation management options.

2.6.2.2 TIMBER SUPPLY – QUALITY

In the past, areas harvested in the Fort Nelson TSA have been regenerated with lower than optimum planting densities. This could potentially affect future timber quantity.

2.6.3 HABITAT ISSUES

Natural Disturbance Regimes - The issues relating to fire disturbance regimes and forest management practice in the Fort Nelson TSA is similar to that described for the Dawson Creek and Fort Nelson TSA's.

Non Productive Cover Conversion - Areas of non-commercial brush (primarily willow and grass) are being converted to spruce. This often involves heavy reliance on herbicides to control vegetation competition. There may be detrimental effects on the presence and distribution of rare ecosystems.

Wildlife Habitat/Forestry Interaction - Common issues of concern to stakeholders concern the habitat requirements of red-listed species and furbearers, including the maintenance of critical habitat for grizzly bear. There is also uncertainty regarding the potential impacts of silvicultural systems on wildlife habitat

General Issues - The TSA contains vast tracts of relatively undeveloped land that supports abundant diverse and internationally significant wildlife populations. Large nomadic mammals such as moose, black bear, grizzly bear and stone sheep are common. Furbearers such as wolverine, wolf, lynx, weasel, mink, river otter, beaver and coyote are prevalent in the TSA. Regionally significant species include mountain goat, caribou, marten, thinhorn sheep, elk, harlequin duck and northern goshawk..

Most reptiles and amphibians are ill-adapted to the northern climate and few species are present in this timber supply area. However, it is home to a unique range of bird species, many of them eastern species not otherwise found in BC. Conversely, many birds found in other parts of the province do not occur in this timber supply area. The abundant rivers, lakes, ponds and marshes provide important staging grounds during the migration of water birds such as pintails, widgeons, geese and teal.

Many fish species important as game are found in the water bodies of this area. These include some trout species, whitefish, Burbot, Arctic grayling, northern pike and walleye. The rare occurrence of some salmon species has also been noted in some of the major rivers. Approximately 15 game and non-game fish species occur only in this part of the province.

The Boreal White and Black Spruce Zone has the least snowfall of all the northern BC zones and consequently is very important for wintering ungulates. Also in that zone, frequent forest fires have formed a mosaic of upland forests of different ages, providing a variety of habitats. The extensive deciduous forests frequently achieve older age classes and are important for ungulates, birds and small mammals.

2.6.4 SILVICULTURAL PRACTICES

2.6.4.1 SILVICULTURAL HISTORY

Table 2.6.1 records backlog (pre-1988 openings) silviculture for the TSA. Only silvicultural activities which took place after 1985 are shown. Table 2.6.2 records current (post 1998 openings) silviculture achievements.

Table 2.6.1 Backlog silviculture history 1986-99, Fort Nelson TSA

Year	Backlog Site Preparation (ha)	Backlog Planting (ha)	Backlog Brushing (ha)
1986	1659	1175	
1987	2136	1640	235
1988	2066	1659	718.5
1989	1932.7	2686.4	822
1990	1975.5	1514.1	698
1991	2924.8	2214.5	2115
1992	2751	2334	2384
1993	1072.5	1409.3	2441.6
1994	1231.8	823.8	2702.6
1995	628.8	994.2	2050
1996	388.4	907.5	513.3

1997	183.9	131.1	1662.9
1998			1017.8
1999			46.2
Total	**18950.4**	**17488.9**	**17406.9**
Data Source: ISIS Onetime November 23, 1999, IEA Section, Forest Practices Branch			

Table 2.6.2 Current silviculture history 1986-99 , Fort Nelson TSA

Year	Backlog Site Preparation (ha)	Backlog Planting (ha)	Backlog Brushing (ha)
1988	368		
1989		346	
1990	76.8	23	171
1991	1377.6	1933.5	
1992	2796.4	2984.4	
1993	3590.9	3415	1600.8
1994	2836.2	3622.7	1271.8
1995	2876.4	3673.2	1526.1
1996	1965.1	4095.6	1702.4
1997	2161.4	5103.8	694.1
1998	1056.9	2956.9	369
1999	45.7	491.7	23.2
Total	**19151.4**	**28645.8**	**7358.4**
Data Source: ISIS Onetime November 23, 1999, IEA Section, Forest Practices Branch			

2.6.4.2 BACKLOG SILVICULTURE

The area of backlog not satisfactorily restocked land is 11 000 ha. The area of satisfactorily restocked land is 30 000 ha.

As of October1, 1987 the Ministry of Forests took over responsibility for all areas logged prior to this date. In 1988 the forest Service divided the district into administration zones for backlog purposes. Some zones have almost been completed and have little or no NSR hectares within them.

Slocan forest Products Ltd. is an active participant in the backlog program. The company has prepared a backlog silviculture plan for the adminstration zones assigned to it two years ago and is currently completing on-the-ground activities. Slocan has been assigned three more administration zones last year and they are finishing the planning process and prescriptions for the zones. Majority of the activities for the next year will be in these administration zones.

2.6.4.3 PRECOMMERCIAL THINNING

2.6.4.4 TREE IMPROVEMENT

The projected gain from improved seed for the Fort Nelson Region is tabulated in Table 2.6.3

Table 2.6.3 Project gain from improved seed per species, Fort Nelson TSA

		Gain from Improved Seed (%)

Species & Seed Zone	Elevation (m)	98-99	99-00	2007-08
Sx PR low	<1200	-	-	23
Data Source: Forest Genetics Council				

2.6.5 TSR 1 MANAGEMENT ASSUMPTIONS

In addition to the inventory, or current state of the forest, assumptions about how it will be managed as essential for determining a silviculture strategy.

2.6.5.1 INVENTORY PROFILE

The current inventory of the Fort Nelson TSA is recorded in Table 2.6.4. Mixedwood stands are a component of Table 2.6.5.

Table 2.6.5 Current inventory profile by area, Fort Nelson TSA, 2000

	Current Species Profile of the THLB
Species	**Area%**
Spruce	43
Aspen	29
Pine	20
Birch	5
Cottonwood	3
Data Source: Fort Nelson Silviculture Strategy Workshop Questionnaire, Jan. 24, 2000	

2.6.5.2 MANAGEMENT ZONES AND FOREST COVER REQUIREMENTS

The TSR1 forest cover requirements used to achieve integrated resource management objectives are listed in Table 2.6.6. Table 2.6.7 illustrates the TSR2 forest cover requirements used in management zones, while Table 2.6.8 lists the forest cover requirements used in draft landscape units.

Table 2.6.6 TSR1 management zones and forest cover requirements for the Aspen Resource Analysis, Fort Nelson TSA, 1992

Analysis unit	Critical minimum green-up age (yrs)	Maximum percent area younger than the critical minimum (green-up %)	Critical minimum mature cover age (yrs)	Maximum percent area younger than the critical minimum (mature cover %)
All analysis units	12	50	80	20
Data Source: Fort Nelson TSA Timber Supply Analysis Report Aspen Resource, 1993, p.32				

Table 2.6.7 TSR2 management zones/groups and forest cover requirements, Fort Nelson TSA, 1997

Management Zone/Group	Green-up height (metres)	Maximum allowable disturbance (% area)
Retention VQO	5	3
Partial retention	5	10
Modification	5	20.5
Maximum modification VQO	5	33
Integrated resource management	3	39
Integrated resource management in major river corridors	3	39
Special management	3	39
Special management in major river corridors	3	39
Data Source: Fort Nelson TSA TSR2 Data Package, 1997, p. 26		

Table 2.6.8 Draft landscape unit forest cover requirements, Fort Nelson TSA 1997

Management Zone/Group	NDT	Biogeo-classification	Minimum age mature and old (years)	Minimum retention area per cent (%)	Minimum age old (yrs)	Minimum retention area per cent (%)
All draft landscape units	2	SwB	n/a	n/a	250	9.4
	3	BWBS-Decid.	80	19.6	100	13.6
	3	BWBS-Conif.	100	18.7	140	11.5
Data Source: Fort Nelson TSA TSR2 Data Package, 1997, p. 27						

2.6.5.3 HARVESTING PRACTICES

Minimum harvestable criteria used in TSR1 are found in Table 2.6.9, while minimum harvestable ages used in TSR2 are found in Table 2.6.10.

Table 2.6.9 Minimum harvestable criteria by leading species, Fort Nelson TSA 1992

		Alternaitve Plan Minimum harvestable volume		Aspen minimum harvestable volume
Type group	Distance zone	A (volume/ha)	B (volume/ha)	(volume/ha)
All analysis unit except Aspen	Near	140	100	
	Medium	140	100	
	Far	140	100	
Aspen	Near			150
	Medium			150
	Far			n/a

Data Source: Fort Nelson TSA TSR1 Data Package 1992, p.37

Table 2.6.10 Minimum harvestable criteria by leading species, Fort Nelson TSA 1997

		Minimum criteria		
	Analysis unit	Height (metres)	Volume (m^3/hectare)	Minimum harvestable age (yrs)
1	Spruce	20	140	n/a
2	Spruce/pine	20	140	n/a
3	Spruce/deciduous	20	140	n/a
4	Aspen/coniferous	20	140	n/a
5	Aspen/deciduous	20	140	n/a
6	Pine	20	140	n/a
7	Pine/deciduous	20	140	n/a
8	Cottonwood/coniferous	20	140	n/a
9	Cottonwood/deciduous	20	140	n/a
10	Spruce/larch	20	140	n/a
11	Balsam fir	20	140	n/a

Data Source: Fort Nelson TSA TSR2 Data Package, 1997, p. 19

The 3-year average area harvested is 4 088 hectares. This area is made up of both coniferous and deciduous forest types. The area clearcut was approximately 95% of the total harvest.

The annual volume harvested between 1995 and 1998 is represented in Table 2.6.11.

Table 2.6.11 Annual volume harvested, Fort Nelson TSA

Year	Forest License A17007	Balsam Poplar Forest License A22797	Pulpwood Agreement NO 14
1994/04/01-1995/03/31	**Total** 608,615m3	**Total** 61,355m3	
1995/04/01-1996/03031	**Total** 774,430m3	**Total** 26,027m3	
1996/04/01-1997/03/31	Sw (65%) 569,510m3 Pl (19.4%) 170,354m3 At & Ac (15.6%) **Total** 876,877m3	**Total** 22,173m3	**Total** 373,473m3
1997/04/01-1998/03/31	Sw (64%) 320,418m3 Pl (17%) 83,794m3 At & Ac(19%) 92,906m3 **Total** 497,118m3	No harvestiing	Sw (23%) 82,664m3 Pl (2%) 8853m3 At (75%) 275,616m3 **Total** 367,134m3
1998/04/01-1999/03/31	Sw (84%) 253,628m3 At(13%) 38,491m3 Ac (3%) 10,279m3 **Total** 302,221m3	No harvesting	Sw (15%) 106.295m3 At (82%) 553,614m3 Ac (3%) 17,348m3 **Total** 677,257m3
Data Source: Fort Nelson Silviculture Strategy Workshop Questionnaire, Jan. 24, 2000			

2.6.6 TIMBER SUPPLY DYNAMICS AND AAC - CONIFEROUS AND NON ASPEN GROWING STOCK

The Fort Nelson TSA timber supply analysis (1992) separates the timber supply forecast into coniferous-deciduous and aspen components and so this section is presented in two parts:

- Coniferous and Non-Aspen Timber Supply Dynamics, which deals only with the coniferous harvest forecast and sensitivity analysis;
- Aspen Timber Supply Dynamics, which deals only with the aspen harvest forecast and sensitivity analysis.

The 1992 Fort Nelson Timber Supply Analysis was accomplished before the introduction of the Forest Practices Code. In an attempt to integrate Integrated Resource Management (IRM) guidelines into TSR1 three options were developed:

- Option I - Current Plan
- Option II – Current Performance
- Option III – Alternative Plan (A)

2.6.6.1 TIMBER SUPPLY DYNAMICS – NO CONSTRAINTS OR SILVICULTURE

Option I – Current Plan

For Option I – Current Plan, harvest constraints for accessibility and IRM were assumed to decrease over the next 50 years. The initial amount of net immature timber, which is economically available for harvesting was 18%. This value increased to 30% at the end of 50 years, and 100% for the rest of the planning horizon. The constraints for accessibility (harvest pattern constraints) do not simulate field operations, therefore the effect of these constraints are not considered when viewing the results. The resultant timber supply forecast is not constraint by any factors.

The area of coniferous stands in the timber harvesting land base for TSR1 was 612 763 hectares. The 1992 TSR, upon which the current AAC determination was based, forecasts an initial harvest level of 750 000 m³ for the first 10 years, declining to a low of 575 000 m³ at the end of 20 years (Figure 2.6.2). This harvest level then rises to the LRSY of 1 042 000 m³ in 40 years time.

The area of cottonwood stands in the timber harvesting land base for TSR1 was 53 612 hectares. The 1992 TSR, upon which the current AAC determination was based, forecasts an initial harvest level of 169 000 m³ for the first 10 years, declining to a low of 123 000 m³ at the end of 30 years (Figure 2.6.3). This harvest level then rises to the LRSY of 166 000 m³ in 50 years time.

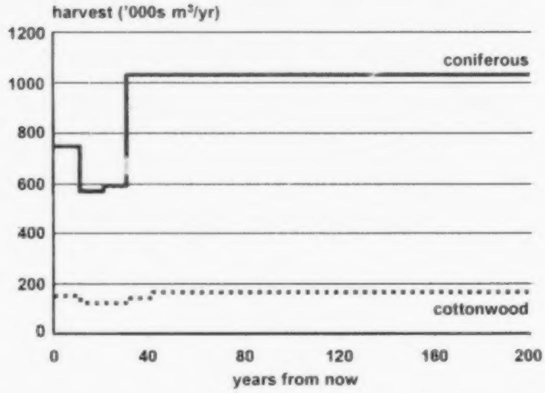

Figure 2.6.2 Coniferous and cottonwood base case harvest forecast, Fort Nelson TSA 1992

The harvest forecast for coniferous stands can increase by 45% after decade 4 because of the amount of immature sites becoming operable. The initial percentage of merchantable immature stands was 18%, but when the forecast reaches the 4th decade 100% of these stands become operable contributing to the timber supply forecast.

The cottonwood harvest forecast can also be explained by the amount of immature stands coming on-line. Once immature stands become operable harvest levels can be increased.

2.6.6.2 SENSITIVITY TO LAND BASE REDUCTIONS AND FOREST COVER CONSTRAINTS

Option II – Current Performance

Option II – Current Performance sets constraints to account for harvest pattern by utilizing a two pass harvesting system (50%/50%) with a 10 (cottonwood) and 20 (coniferous) year harvesting delay between passes. It was assumed this scenario would account for buffer strips, site degradation, and roads and rights of way. Also constrained is the amount of area in the timber harvesting land base. For the coniferous scenario the THLB was reduced by 42%, while the cottonwood scenario THLB was reduced by 86%. Both of these reductions drastically lowered the amount of available timber and subsequent harvest levels.

In this early attempt to model constraints such as buffers, site degradation and roads as well as possible land base reductions it was shown that these constraints will decrease harvest levels as shown by the differences in the harvest forecasts for Option I and Option II for both coniferous (Figure 2.6.4) and cottonwood(Figure 2.6.5) harvest forecasts.

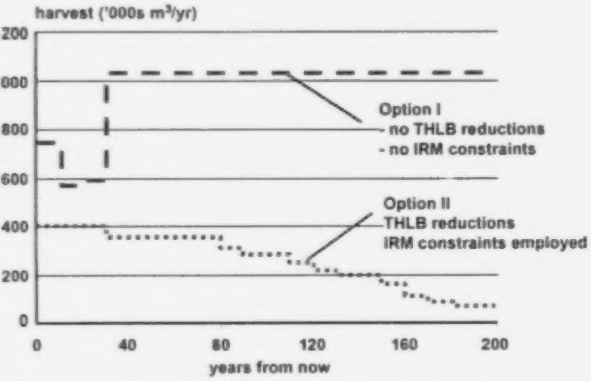

Figure 2.6.3 Sensitivity of coniferous harvest forecast to THLB reductions and constraints, Fort Nelson TSA 1992

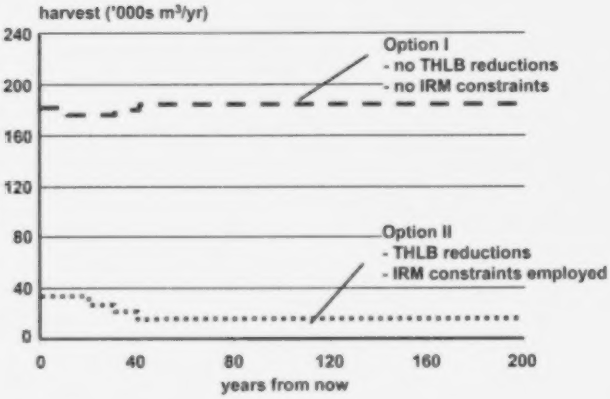

Figure 2.6.4 Sensitivity of coniferous harvest forecast to THLB reductions and constraints, Fort Nelson TSA 1992

Various silvicultural activities and shifts in forest product objectives can be interpreted as bringing land into the timber harvesting land base and so the comparison of Option I and Option II (Figure 2.6.3 and Figure 2.6.4) will provide information on the magnitude and timing of the benefits. Decreases to the timber harvesting land base will decreases timber supply across the entire planning horizon.

2.6.6.3 SENSITIVITY TO SILVICULTURAL ACTIVITIES AND INTEGRATED RESOURCE MANAGEMENT

Option II – Current Performance

Figure 2.6.5 illustrates three scenarios examining alternative silviculture scenarios on the coniferous component of the THLB. The first scenario which employs current silviculture (1992) has a lower harvest rate compared to the second scenario which utilizes basic silviculture. Basic silviculture, in this case, increases the amount of merchantable stands found in the timber harvesting land.

The last scenario, incremental silviculture defined as a planned level of NSR and NCBr reforestation will have a higher harvest level than the basic silviculture scenario because the future inventory is increased by 1 800 hectares per year.

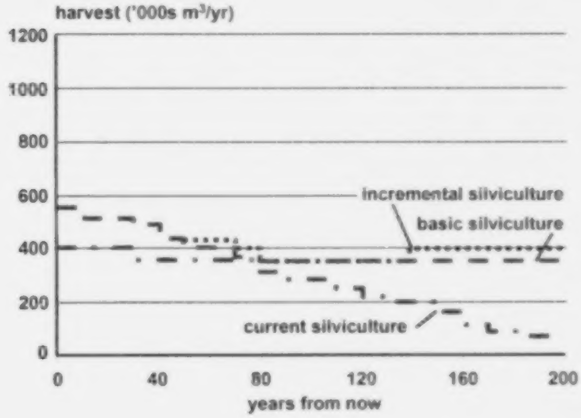

Figure 2.6.5 **Silvicultural impacts on the coniferous harvest forecast, Fort Nelson TSA 1992**

Option III – Alternative Plan (A)

In this scenario, the simulation of timber harvesting activities integrated with other resource values was accomplished. Table 2.6.12 lists the resource units and management priorities.

Table 2.6.12 **Resource units and associated management priorities, Fort Nelson TSA 1992.**

Resource Unit	Management Priority
RU 1	An area with future timber potential, but not economic at this time. This area has other resource values which at the time are conserved through the exclusion of these areas from the AAC.
RU 2	An area that has world class wilderness and outdoor recreation opportunities. This area will be conserved through limited timber harvesting with harvesting constraints to achieve wildlife habitat objectives.
RU 3	An area that, in addition to some moderate tomber values, has important visual, outdoor recreation, and wildlife habitat. This area will be conserved through limited timber harvesting with harvesting constraints to achieve visual, outdoor and wildlife habitat objectives.
RU 4	An area that has important timber values as well as important wildlife objectives. This area will also be managed as an integrated resource area but with less severe harvesting constraints.
RU 5	An area with less important timber values but important subsurface values. No timber harvesting constraints are applicable in this area.

RU 6	An area that has existing and potential agriculture development. This land base no longer supports the AAC.
Data Source: Fort Nelson TSA Analysis Report 1992, p. 7	

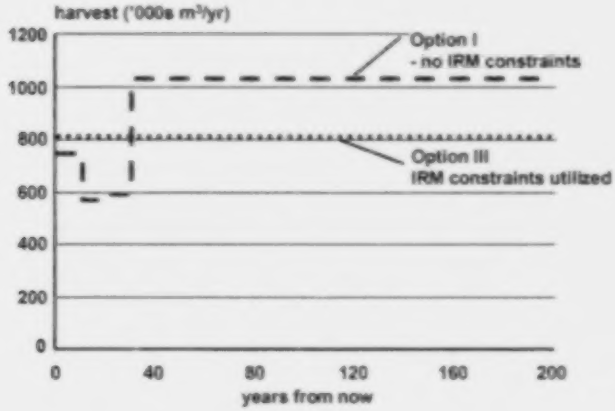

Figure 2.6.6 **Sensitivity to integrated resource management on the coniferous harvest component, Fort Nelson TSA 1992**

The forest inventory was disaggregated into the resource units in order to have the applicable constraints imposed. A three pass harvesting system was modeled in the RUs 2 and 3, and a two pass system in RU 4.

Figure 2.6.6 illustrates the effects of integrated resource management on the harvest forecast. The harvest forecast which does not take into account other values (Option I), is substantially higher than Option III.

Changing environmental and social values affects the harvest forecast because of constraints placed on the amount of stands older than a specified age (Figure 2-4). When old-growth forest cover requirements become increasingly restrictive the amount of area which can be of a mature age is lessened causing the harvest forecast to be lower than Option I which employs no IRM constraints. This decrease can be attributed to further restrictions placed on the mature surplus of timber. Constraints set in the analysis will be increasingly met when the mature cover constraints are increased.

It should also be noted that employing alternative silvicultural treatments aids in alleviating certain forest cover constraints. Several harvesting techniques and equipment could be used to retain merchantable older timber in a certain area, therefore lessening the number of green-up and old-growth forest cover constraints being met. This allows the harvest forecast to capture additional volume from the surplus available.

Figure 2.6.7 demonstrates the effects of silvicultural activities on the harvest forecast. Increasing regeneration capabilities of regenerating and non-merchantable stands leads to increased harvest forecasts. Bringing non-merhcantable land into the THLB through incremental silviculture, will have immediate and long-term effects on the timber supply forecast. It should also be noted that coniferous volumes are higher than mixedwood volumes, therefore if the land base regenerates to coniferous stands the growing stock will increase leading to increased harvest forecasts.

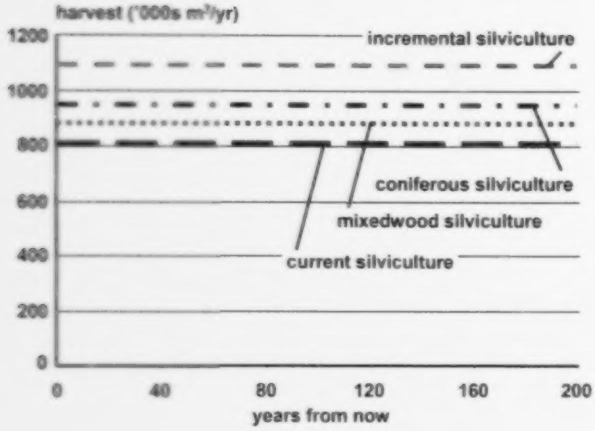

Figure 2.6.7 **Sensitivity of the coniferous harvest component to silviucltural activities, Fort Nelson TSA, 1992**

Silvicultural regimes can be employed to reduce the number of years to reach free-growing status (regeneration delay). Pre-free growing regimes such as improved planting stock, site preparation, herbicide and fertilization are just a few examples of regimes which could lessen the number of years required to reach free-growing status.

2.6.6.4 SENSITIVITY TO UTILIZATION STANDARDS

Option III – Alternative Plan (A) – Alternative Utilization Strategies

Two scenarios were employed to demonstrate the effects of alternate utilization standards:

- current utilization standards of deciduous species and basic silviculture of all harvested areas emphasizing mixtures of coniferous and deciduous species in mixedwood stands;
- close utilization standards of deciduous species and basic silviculture of all harvested areas emphasizing mixtures of coniferous and deciduous species in mixedwood stands.

Figure 2.6.8 to 2.6.10 illustrate the effects of alternate utilization standards on coniferous, cottonwood, and apsen components of the THLB.

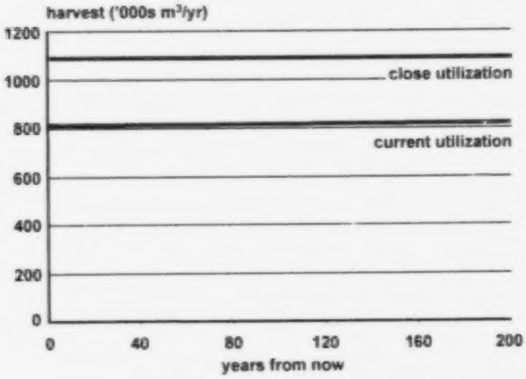

Figure 2.6.8 Sensitivity to alternate utilization standards on the coniferous harvest forecast, Fort Nelsen TSA, 1992

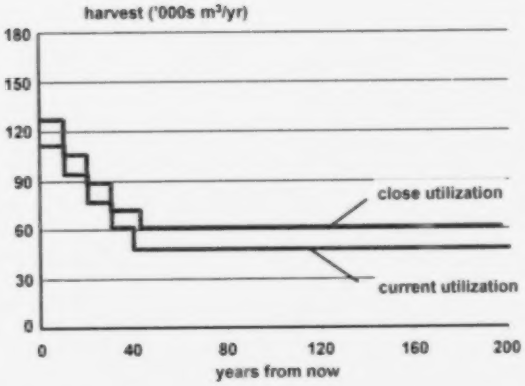

Figure 2.6.9 Sensitivity to alternate utilization standards on the cottonwood harvest forecast, Fort Nelsen TSA, 1992

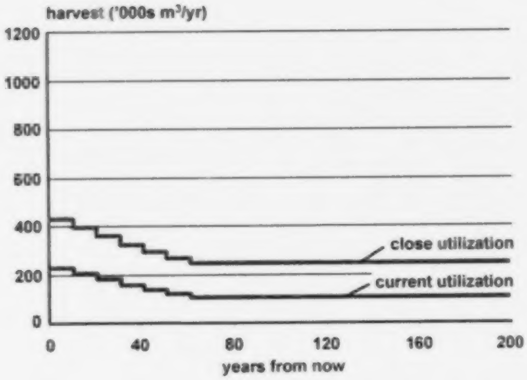

Figure 2.6.10 Sensitivity to alternate utilization standards on the aspen harvest forecast, Fort Nelsen TSA, 1992

In all three scenarios the harvest forecast can be increased by utilizing additional portions of the THLB. Several harvesting techniques and equipment could be used to retain merchantable species in stands. This allows the harvest forecast to capture additional volume from the surplus available.

2.6.7 TIMBER SUPPLY DYNAMICS AND AAC - ASPEN GROWING STOCK

The aspen review was limited to Forest Licence A32900. The THLB supporting the analysis was 472 716 hectares . A priority of the analysis was incorporating the IRM objectives listed in Table 2.6.6.

An even-flow harvest level of 1 108 500 m³ per year is forecasted (Figure 2.6.11). The level can maintained due to the current age class distribution and growth rate of the deciduous species. Over 70% of the area is mature. Once aspen leading stands are harvested they are assumed to regenerate back to aspen. Aspen stands will have a high growth rate due to the competitive nature of the species (non-shade species). These stands will have accelerated life cycles, therefore constantly replenishing the growing stock and supporting the harvest forecast.

It should be noted that the IRM objective that no more than 50% of the THLB be in a non greened-up state (less than 12 years old) at any time could be pushed to no more than 11% of the THLB in a non greened-up state before the LTHL would be adversely affected.

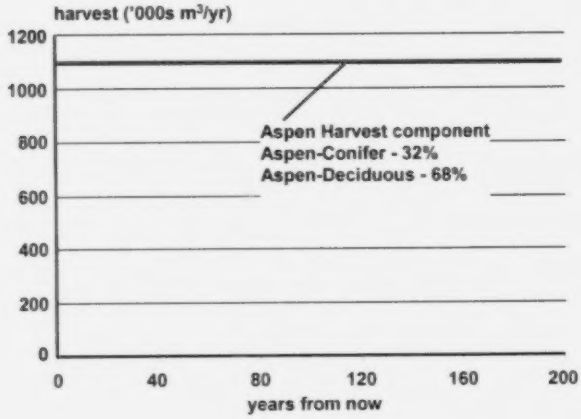

Figure 2.6.11 **Aspen harvest forecast, Fort Nelson TSA, 1992**

2.6.8 TIMBER SUPPLY DYNAMICS - SUMMARY

The only constraint on timber supply in the Fort Nelson TSA is the physical scarcity of harvestable timber in the early short to early mid-term. This scarcity requires that volumes of existing mature timber from unmanaged stands be rationed until immature stands are ready for harvest. The rationing mechanism (TSR harvest flow constraints) can also be used to convey back to the short- and early mid-term the future timber supply benefits resulting from manipulating forest-level parameters. Silvicultural practices that modify stand yields, and the extent of the timber harvesting land base will have significant effects on timber supply.

Utilizing alternative silvicultural methods can lessen the amount in which the timber supply is reduced. Numerous harvesting techniques and equipment could be utilized to alleviate the constraints set by integrated resource management and utilization standards, therefore allowing harvesting to occur in stands which were previously tied up in forest cover requirements or lost entirely due to differing utilization standards.

2.6.9 THE TIMBER SUPPLY (TSR2) CONTEXT OF SILVICULTURE

The Fort Nelson TSA is undergoing TSR 2 analysis at the time of this RMP. The potential implications to sustainable harvest silviculture planning of the new TSR assumptions is included here for reference. The full impact of the new analysis will be reflected in the 2002 Sustainable Harvest RMP.

2.6.9.1 TIMBER SUPPLY FORECAST AND THE AAC

Figure 2.6.12 shows the base case forecast for deciduous stands remaining at the current AAC of 900 000 m^3 for 200 years. However, the TSR2 representation of the timber harvesting land base is forecast to sustain a conifer harvest of 1 396 000 m^3. This base case level is more than twice the current conifer AAC.

The timber supply (both conifer and deciduous) is most sensitive to the site index thresholds used to exclude stands of low productivity from the timber harvesting land base. These thresholds were developed from a review of recent harvesting operations but they respond to shifts in costs and market prices, so are inherently uncertain. As illustrated on Figure A5-1, conifer supply fluctuates from 19% below the base case to 32% above, depending on whether or not the upper or lower end of the range of uncertainty is used to set the threshold. Similarly, the deciduous resource could increase to 21% above the base case if the lower end of the site index threshold were used, and would be 35% lower (long-term timber supply) if the upper end were used.

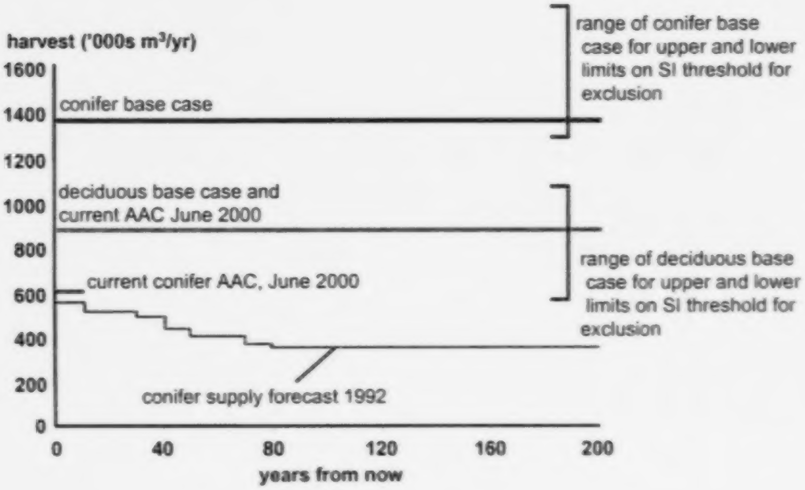

Figure 2.6.12 Base case harvest forecasts for conifer and deciduous stands.

2.6.9.2 BLACK SPRUCE – A CRITICAL ISSUE

The potential to include black spruce in the timber harvesting land base was identified in the report as critical issue with respect to timber. Black spruce was excluded due to uncertainties about the inventory as well as limited harvesting performance. However, the potential impact on conifer timber supply of including black spruce (above a site index threshold specified in the report) is substantial – 30% over the next 100 years, relative to the base case harvest projection. A reduction in inventory related uncertainties may make black spruce an attractive resource.

A further obstacle to the harvesting of black spruce stands are silvicultural and regeneration difficulties associated with a high water table. The report notes that as more specific ecological (site series) inventories are completed, it may be possible to make specific land base exclusions where regeneration problems are anticipated.

2.6.9.3 MIXED WOOD MANAGEMENT -- A CRITICAL ISSUE

The management of mixedwood stands is also identified in the report as a critical issue. Mixedwood coniferous leading stands comprise 35% of the coniferous timber harvesting land base and excluding them reduces timber supply by 27.5%. Mixedwood deciduous leading stands comprise 32% of the decidous timber harvesting land base and excluding them reduces timber supply by 33% over the long term. The report notes that Ministry of Forests staff are currently working with the local forest industry to develop a mixedwood management strategy.

2.6.9.4 CONCLUSION

The TSR2 Fort Nelson Timber Supply Area Analysis Report identifies three issues that may help guide silviculture planning on the management unit:

- Both the conifer and deciduous timber supply are very sensitive to the site index thresholds used to exclude stands of low productivity from the timber harvesting land base. These thresholds represent economic margins and respond to changes in operating costs and market prices.
- Silvicultural and regeneration difficulties associated with a high water table are an obstacle to the to the inclusion of black spruce stands in the conifer timber supply.
- Silviculture management of mixedwood stands is not fully understood and current practices may result in silviculture costs that are higher than is necessary and degradation of habitat.

2.6.10 KEY ISSUES AND POTENTIAL SILVICULTURAL STRATEGIES

This section identifies the key Sustainable Harvest issues facing the TSA, as well as potential silvicultural strategies suitable for addressing them. Of those resource supply issues described in Section 2.6.2, four are considered key by management unit stakeholders:

- Spruce budworm infestation losses.
- Potential productivity losses within the timber harvesting landbase.
- Productivity losses due to non commercial forest cover.
- Potential losses of timber production due to management constraints within riparian zones.

Strategies considered feasible and desireable are listed in Table 2.6.13, along with their priority rankings determined by management unit stakeholders. The forest level impacts of each stategy and tactic are estimated in Table 2.6.14. This set of strategies must be considered provisional at this time; they must be analysed and evaluated in further forest estate modelling.

Most importantly, the resource inventory on which they are based must be updated to ensure the current state of the forest is accurately described. If this is not done, apparent issues and possible strategic solutions could be misleading. In the meantime, and for this RMP, local technical expertise, current policies and present uncertainties surrounding some of the strategies

Table 2.6.13 Key issues and possible silvicultural strategies and tactics for the Fort Nelson TSA.

Key Issues	**Management Objective**	**Silvicultural Strategy**	**Target Stands**	**Silvicultural Tactics**	**Priority**
1. Budworm Infestation Losses	Suppression of budworm	1.1 Infestation Control	Infested plantations	BT spray	2
2. Productivity of THLB TSR assumes backlog reforested in 10 years but assumes herbicide use, does not recognize 1st nations issues, uncertainty wrt funding and underfunding, uncertainty as to priority	Maintain production on THLB	2.1 Maintain the Timber Harvesting Land Base	Backlog NSR	Surveys - all stages	1
				Site preparation	1
				Planting	1
				Brushing	1
		2.2 Increase Operability	Impeded stands	Brushing - chemical	1
				Brushing – manual	1
3. Productivity Losses of NCBr. TSR assumes backlog reforested in 10 years; habitat issue is that willow and grass --> spruce, reduces diversity, question economics; loss of mature willow (habitat opportunities); conflict re herbicide	Afforest NCBr	3.1 Increase the Timber Harvesting Landbase	NCBr	Surveys – all stages Site preparation Planting Brushing - manual Brushing - chemical	3
4. Productivity Losses in Riparian Management Zones Harvesting to streamside; backlog; herbicides restricted	Develop Management Methods for Riparian Znes	4.1 Increase Operability/Increase Yields	Backlog in riparian zones	Surveys	4
			Backlog in riparian zones	Brushing - manual	4

Table 2.6.14 Key Issues, silvicultural strategies and tactics with forest level impacts, Fort Nelson TSA

Key Issues	Silvicultural Stategies	Silvicultural Tactics	Opportunity	Timber Supply Effects				Habitat	Jobs	Cost	
			Area	Short	Medium	Long	Quality		Days/ha	$/ha[1]	Rank
				0-20	21-120	121+					
Budworm Infestation Losses	1.1 Control Infestation	BT Spray Program	560		M	M		+/-	0.1	400	2
Potential Loss of THLB	2.1 Maintain THLB	Surveys – backlog (all stages)	6000			M		+/-	0.1	60	1
	2	Site Prep./plant/brush - NSR	600			M		+/-	2.5	1600	
	2	Chemical Brushing - impeded	900			M		+/-	0.2	400	1
	2	Manual Brushing - impeded	670			M		+/-	4.0	1400	
											3
Potential Productivity Losses on NCBr	3.1 Increase THLB	Surveys	1000			M		+/-	0.1	60	
	3	Site Preparation	250			M			0.6	400	
	3	Plant	250			M			2.0	800	
	3	Chemical Brushing	250			M			0.2	400	
	3	Manual Brushing	250			M			4.0	1400	
											4
Potential Productivity Losses due to Ribparian Constraints	4.1 Maintain THLB/Increase Yields	Manual Brushing	10					+	4.0	1400	
	4	None (stratify for habitat management)						+			

2.6.10.1 ISSUE 1: BUDWORM INFESTATION LOSSES

Strategy 1.1: Control Budworm Infestation

TACTIC 1 – UNDERTAKE A BT SPRAY PROGRAM IN THE TSA

Target Stands:

Infested and threatened stands in the TSA.

Expected Forest Level Benefits:

Strategies to protect forest health are intended to maintain conditions favorable for maximizing timber production. Avoiding pest problems will help maintain productivity levels already assumed in TSR, thus no gains per se are expected. A widespread population control program is not anticipated, but localized protection of threatened plantations using spray programs may be of value.

2.6.10.2 ISSUE 2: POTENTIAL LOSS OF PRODUCTIVITY IN THE THLB

Strategy 2.1: Maintain the Size and Productivity of the Timber Harvesting Land Base

TACTIC 1 – BACKLOG NSR TREATMENT REGIMES

and

TACTIC 2 – BACKLOG IMPEDED STAND TREATMENT REGIMES

Target Stands:

All backlog NSR and impeded stands in the TSA.

Expected Forest Level Benefits:

The Fort Nelson TSA has a larger than average proportion of backlog stands requiring treatment to reach free growing. TSR II assumed that all backlog areas would be treated over a period of 10 years. Current funding levels, however, are sufficient to treat this area at only approximately half the assumed rate, requiring a 20-year period for completion. This in turn will result in a delay in areas again being available for harvest 10-14 decades from now, around the time of the transition from primarily old growth harvesting to primarily second growth harvesting. Delayed availability of some second growth stands may result in a small fibre supply deficit at that time. This is particularly critical given that backlog sites tend to be some of the most productive in the TSA.

2.6.10.3 ISSUE 3: PRODUCTIVITY LOSSES DUE TO NON-COMMERCIAL FOREST COVER

Strategy 3.1: Increase the Size of the Timber Harvesting Landbase

TACTIC 1 – NON-COMMERCIAL BRUSH REHABILITATION TREATMENT REGIMES

Target Stands:

Stands regenerated to non-commercial forest cover following wildfire throughout the TSA.

Expected Forest Level Benefits:

It is estimated that the Fort Nelson TSA includes 500,00 to 800,000 of land that has regenerated to non-commercial species, primarily brush, after wildfires. Conversion of non-commercial timber types to commercially valuable forest cover would increase the size of the timber harvesting land base.

In the timber supply analysis for TSR II it was assumed that 2500 ha would be converted over the next 10 years. Assuming average productivity for the TSA, this is sufficient to increase the LTHL by 6900 m^3/yr. Each additional 2500 ha treated would have a similar effect. Currently, achievement of this assumed treatment is questionable, as funding is insufficient to treat all backlog sites which are considered high priority by the District.

Conversion treatments consist of clearing existing cover, planting, and controlling brush. The cost of these treatments ranges from $1600/ha to $2600 /ha.

2.6.10.4 ISSUE: POTENTIAL PRODUCTIVITY LOSSES DUE TO MANAGEMENT CONSTRAINTS IN RIPARIAN ZONES

Strategy 4.1: Maintain the Size of the Timber Harvesting Land Base/Increase Yields

TACTIC 1 – SURVEY AND RECLASSIFY POTENTIAL FOR HABITAT VS TIMBER

and

TACTIC 2 – IMPEDED STAND BRUSHING – MANUAL

Target Stands:

Riparian management zones in the NSR land base.

Expected Forest Level Benefits:

A small portion of the backlog NSR area consists of riparian areas. A strategy is required to deal with these areas, probably including altered stocking standards, in order to protect or enhance their value as habitat. It was estimated that only a very small area (10 ha) would be treated each year.

2.6.11 RECOMMENDED KNOWLEDGE STRATEGIES

There are many related TSA silvicultural issues which are not directly addressable via silvicultural practices. Many of these require investigation and further study. Table 2.6.15 identifies, and ranks the importance of 8 Sustainable Harvest knowledge gap issues.

Table 2.6.15 Issues requiring further investigation.

Issue	Rank
Herbicide use Concern was expressed in the workshop regarding future availability of herbicides as a silvicultural tool. This concern is rooted in local perceptions of habitat loss from reduced natural variability, and herbicide use being a negotiation item in discussions with the local First Nation. Inability to use herbicides may result in reduced stocking and thus lower yields, and/or reductions to the timber harvesting land base. *There is a need to estimate potential stand level impacts of a "no herbicide" policy, and to use FSSIM to investigate impacts on timber supply.*	1
Mixedwood management Silviculture management of mixedwood stands is not fully understood; practices to maintain current mixtures in future stands are poorly defined if defined at all – existing stocking standards for mixedwoods are based on largely on theory and speculation. Current practice by intent is to "unmix" the mixedwoods, trending toward either pure deciduous or pure conifer stands. Recognized drawbacks to this strategy include potentially higher than necessary silviculture costs and potential degradation of habitat where certain niches depend on conifer-deciduous mixtures. *Further support and expansion is required for basic stand level studies into mixedwood management, including both licensee and MoF initiatives, with cooperation across the boreal region of the four western provinces.*	2
Budworm Levels of budworm losses have become increasingly heavy in the Fort Nelson TSA over the last decade, and particularly in the last year. In unmanaged older stands, increased mortality related to this pest has introduced doubts about the "shelf-life" of old growth volumes in relation to that assumed in TSR. In young managed stands, there is ongoing risk stocking losses, particularly where young stands are immediately adjacent to infested older stands. Understory layers in stands are at particular risk, thus threatening the understory conifer layer in some mixedwoods, resulting in reduced options for future management. *There is a need to investigate management options for budworm and their impacts on both timber supply and options for silviculture systems.* Such a study should consider both active treatment options and strategies for stand management with budworm populations as part of the overall forest management context (i.e. the budworm is there – how do we best live with it?). It should be cognizant of potential impacts of different strategies on insect population dynamics, timber supply, habitat and other resource values.	3
Aspen suckering on compacted sites Concern was expressed that a recent shift toward increased summer logging of aspen sites may be resulting in increased amounts of permanent access structures. This concern arises from sites where compaction on skid roads and/or roadside processing areas inhibits suckering of aspen, leaving these areas poorly- or non-stocked. It is assumed that with winter harvesting, compaction would be avoided on most of these areas. *A study is required to quantify the impact of summer harvesting on post-harvest stocking conditions.* This information could then be used to make informed decisions about the costs and benefits of this strategy, and to make appropriate area net-downs related to stocked area for TSR.	4

Salvage Concern was expressed that large amounts of unsalvaged losses occur related to budworm and bark beetle activity. It is perceived that many older stands are losing volume over time, and that TSR yield curves are insensitive to this effect. One study on this problem is nearing completion. *A strategy is required to identify high risk stands so that they can be moved up in the harvest queue.* Current losses to insects are estimated at 34,000 m^3/yr.	5
Low stocking SR Concern was expressed that backlog and older appraisal blocks (approx. pre-1995) may have lower stocking levels than assumed in TSR Blocks with ≥80% conifers only). This could potentially lead to an assumption in the TSR timber supply analysis that yields for these stands are higher than will actually be achieved. *A study is required to assess actual stocking levels on older cut blocks compared to TSR assumptions.* This in turn could lead to an analysis of impacts on timber supply projections.	6
LRMP Protected Area Exclusions Responsibility for silviculture activities on 8 blocks within the newly created Klua Lakes park needs to be resolved. This process is underway.	7
Black Spruce Silvicultural and regeneration difficulties associated with a high water table are an obstacle to the to the inclusion of black spruce stands in the conifer timber supply. Ecological (site series) inventories should be undertaken in order to enable specific land base exclusions where regeneration problems are anticipated.	8

2.7 SUMMARY OF MANAGEMENT UNIT PRIORITIES

2.7.1 PRINCE GEORGE TSA

Key Issues	**Silvicultural Strategy**	**Silvicultural Tactics**	**Priority**
Mid-term gap in fibre supply	Move Stands up in Harvest Queue (increase operability)	Thinning Fertilization	11
		PCT preparatory to CT	5
	Increase Volume Yields	Fertilize on 10-yr cycle	10
		Fertilize on 10-yr cycle	10
		Survey IU Stands	3
		Reclassify/Harvest IU Stands	4
Productivity of Backlog stands	Maintain Productivity ofTHLB Land Base	Survey and reclassify	1
		Site preparation Planting brushing	2
		Brush/space	1
		Brush/space	2
		Brush, space	2
		site prep, plant under canopy or in voids	8
		Site prep plant IU	8
Managed Stand Pest Losses	Minimize Stocking Losses due to Infections	Prune infected branches	7
		Monitor/Map risk due to forest health hazards	6
Repression Losses	Increase THLB/increase yields by treating repressed Pli stands to make them operable/replacing them with normal stands	Survey	5
		Reclassify, bring into THLB, early harvest	5
		Rehabilitate and plant	5
		Thin, fertilize	5
Maintaining Timber Quality	Clearwood pruning	Branch pruning, single lift	12

2.7.2 ROBSON VALLEY TSA

Key Issues	Silvicultural Strategy	Silvicultural Tactics	Priority
Declining short, medium and long term timber supply	Reduce minimum harvestable ages by 10 years	precommercial thinning (juvenile spacing)	5
		precommercial thinning	6
	Increase the volume of regenerated stands by 20%	repeat fertilization, 15year cycle	nr
		repeat fertilization, 15year cycle	7
	Maintain the timber harvesting land base	survey	1
		brush	2
		site prep	3
		plant	3
Pest losses to juvenile white pine	Prune to reduce risk of infection	Infected branch pruning	4
Declining timber quality	Clearwood prujning	Branch pruning	8

2.7.3 MACKENZIE TSA

Key Issues	**Silvicultural Strategies**	**Silvicultural Tactics**	**Priority**
Declining timber supply in the short and medium term	Increase volumes of existing stands	Fertilize late rotation PL –decade 2 harvest	5
	Increase volumes of exisiting stands	Fertilize late rotation PL	5
	Increase volumes of regenerating stands	Fertilize 1 application	5
	Increase volumes of regenerating stands	Improved seed	3
		fertilize: 4 applications at 15, 30, 45 and 60 years	5
Loss of productivity on backlog sites	Maintain timber harvesting land base	fill plant	1
		brush and weed	1
Declining timber quality	Ensure clear timber	Prune 2 lifts	7
Potential loss of Caribou habitat	Recruit/modify Pl lichen habit (caribou)	recruit	2
	Recruit Pl lichen caribou habitat	survey	4
Potential loss of Grizzly bear habitat	Grizzly Bear habitat	Precommercial thin	8

2.7.4 DAWSON CREEK TSA

Key Issues	Silvicultural Strategies	Silvicultural Tactics	Priority
Uncertainty in critical issues	Improve Knowledge (SI estimates on backlog)	add growth intercept to FG surveys of treated backlog	1
		add growth intercept to FG surveys (re FG)	1
	Improve Knowledge (Deciduous Stocking)	expand survey to include deciduous—update ledger	1
	Improve Knowledge (Monitoring for vegetation management)	install NIVMA plots	1
Loss of Productivity on Backlog Sites	Maintain Timber Harvesting Land Base (Retire all NSR)	survey to determine opportunities	1
		conifer treatment regimes	1
		deciduous treatment regimes	1
		mixedwood treatment regimes	1
	Maintain Timber Harvesting Land Base (Convert NCbr to THLB	Cut and pile mound, plant, herbicide, survey, fill-plant	3
	Maintain Timber Harvesting Land Base (Convert NCbr to grazing land)	survey and grazing plan	2
		MSP and seeding	3
Decline in Deciduous Harves	Increase Yields (Protect regenerating aspen stands from grazing)	grazing plan to move cattle out of susceptible young stands	2
		implement grazing plan	3
Security of Conifer Harvest	Improve Operability (Reach FG earlier)	survey (pre-early FG)	3
	Maintain Productivity of Timber Harvesting Land Base (Mitigate impact of calamagrostis)	develop methodology for assessing risk pre-harvest	1

2.7.5 FORT ST. JOHN TSA

Key Issues	Silvicultural Strategies	Silvicultural Tactics	Priority
Maintain or Enhance the THLB	NSR Reclassification	photo interpretation	1
		ground surveys	1
	NSR Reforestation	site preparation	1
		planting	1
		manual brushing	1
		herbicide brushing	1
		surveying	1
	Surveys	low productivity sites	2
		non-merchantable stand types	2
		NC Br (recce survey)	3
		old oil and gas roads and well sites	4
Mitigate Fall-down of Deciduous Harvest	Aspen management	fill-plant, or herbicide/plant improved aspen genotypes	5

2.7.6 FORT NELSON TSA

Key Issues	Silvicultural Strategy	Silvicultural Tactics	Priority
Budworm Infestation Losses	Infestation Control	BT spray	2
Productivity of THLB	Maintain the Timber Harvesting Land Base	Surveys - all stages	1
		Site preparation	1
		Planting	1
		Brushing	1
	Increase Operability	Brushing - chemical	1
		Brushing – manual	1
Productivity Losses of NCBr.	Increase the Timber Harvesting Landbase	Surveys – all stages Site preparation Planting Brushing - manual Brushing - chemical	3
Productivity Losses in Riparian Management Zones	Increase Operability/Increase Yields	Surveys	4
		Brushing - manual	4

2.8 MANAGEMENT UNIT SUSTAINABLE HARVEST PLAN DATA

2.8.1 ENHANCED FORESTRY TABLES

2.8.1.1 PRINCE GEORGE FOREST DISTRICT

Activities	Treatment Area Goals (ha)					Plan 2001/02	
Stand Tending	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	1000	1000	1000	1000	1000	30.00	30000
Spacing	300	500	500	500	500	700.00	210000
Pruning	50	50	50	50	50	1000.00	50000
Fertilizing	600	600	1000	1500	2000	350.00	210000
Other	0	0	0	0	0	0.00	0
Totals hectares	1950	2150	2550	3050	3550	256.41	500,000
Planning and prescriptions							50,000
Total dollars							550,000

Forest Health Enhancement

Spacing	0	0	0	0	0	0.00	0
Pruning	0	0	0	0	0	0.00	0
Other treatments	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0

Habitat Supply and Biodiversity Enhancement

Treatments	0	0	0	0	0	0.00	0

Domestic Range

Treatments	0	0	0	0	0	0.00	0

Enhanced Forestry Activities - Management Unit Total

Surveys	1000	1000	1000	1000	1000	30.00	30,000
Spacing	300	500	500	500	500	700.00	210,000
Pruning	50	50	50	50	50	999.98	50,000
Fertilizing	600	600	1,000	1,500	2,000	350.00	210,000
Other stand tending activities	0	0	0	0	0	0.00	0
Totals hectares	1950	2150	2550	3050	3550	256.41	500,000
Planning and prescriptions							50,000
Studies funding							25000
Total dollars							575,000

2.8.1.2 PRINCE GEORGE WOODLOT ASSOCIATION

Activities	Treatment Area Goals (ha)					Plan 2001/02	
Stand Tending	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	0	0	0	0	0	0.00	0
Spacing	50	50	50	50	50	600.00	30000
Pruning	0	0	0	0	0	0.00	0
Fertilizing	0	0	0	0	0	0.00	0
Other	0	0	0	0	0	0.00	0
Totals hectares	50	50	50	50	50	599.95	30,000
Planning and prescriptions							50,000
Total dollars							80,000

Forest Health Enhancement

Spacing	0	0	0	0	0	0.00	0
Pruning	0	0	0	0	0	0.00	0
Other treatments	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0

Habitat Supply and Biodiversity Enhancement

Treatments	0	0	0	0	0	0.00	0

Domestic Range

Treatments	0	0	0	0	0	0.00	0

Enhanced Forestry Activities - Management Unit Total

Surveys	0	0	0	0	0	0.00	0
Spacing	50	50	50	50	50	599.99	30,000
Pruning	0	0	0	0	0	0.00	0
Fertilizing	0	0	0	0	0	0.00	0
Other stand tending activities	0	0	0	0	0	0.00	0
Totals hectares	50	50	50	50	50	599.89	30,000
Planning and prescriptions							5,000
Studies funding							0
Total dollars							35,000

2.8.1.3 ROBSON VALLEY FOREST DISTRICT

Activities	Treatment Area Goals (ha)					Plan 2001/02	
Stand Tending	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	100	100	100	100	100	33.00	3300
Spacing	50	50	50	50	50	950.00	47500
Pruning	20	0	0	0	0	1200.00	24000
Fertilizing	0	0	0	0	0	0.00	0
Other	0	0	0	0	0	0.00	0
Totals hectares	170	150	150	150	150	439.99	74,800
Planning and prescriptions							5,000
Total dollars							79,800

Forest Health Enhancement

Spacing	0	0	0	0	0	0.00	0
Pruning		0	0	0	0	0.00	0
Other treatments	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0

Habitat Supply and Biodiversity Enhancement

Treatments	0	0	0	0	0	0.00	0

Domestic Range

Treatments	0	0	0	0	0	0.00	0

Enhanced Forestry Activities - Management Unit Total

Surveys	100	100	100	100	100	33.00	3,300
Spacing	50	50	50	50	50	949.98	47,500
Pruning	20	0	0	0	0	1,200.00	24,000
Fertilizing	0	0	0	0	0	0.00	0
Other stand tending activities	0	0	0	0	0	0.00	0
Totals hectares	170	150	150	150	150	439.98	74,800
Planning and prescriptions							5,000
Studies funding							0
Total dollars							79,800

2.8.1.4 VANDERHOOF FOREST DISTRICT

Activities	**Treatment Area Goals (ha)**					**Plan 2001/02**	
Stand Tending	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	1020	1368	1552	1109	662	20.00	20400
Spacing	618	1500	1366	500	500	650.00	401700
Pruning	100	100	175	175	175	1100.00	110000
Fertilizing	350	400	400	400	400	400.00	140000
Other	0	0	0	0	0	0.00	0
Totals hectares	2088	3368	3493	2184	1737	321.89	672,100
Planning and prescriptions							0
Total dollars							672,100

Forest Health Enhancement

Spacing	0	0	0	0	0	0.00	0
Pruning	0	0	0	0	0	0.00	0
Other treatments	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0

Habitat Supply and Biodiversity Enhancement

Treatments	0	0	0	0	0	0.00	0

Domestic Range

Treatments	0	0	0	0	0	0.00	0

Enhanced Forestry Activities - Management Unit Total

Surveys	1020	1368	1552	1109	662	20.00	20,400
Spacing	618	1500	1366	500	500	650.00	401,700
Pruning	100	100	175	175	175	1,099.99	110,000
Fertilizing	350	400	400	400	400	400.00	140,000
Other stand tending activities	0	0	0	0	0	0.00	0
Totals hectares	2088	3368	3493	2184	1737	321.89	672,100
Planning and prescriptions							0
Studies funding							98000
Total dollars							770,100

2.8.1.5 FORT ST. JAMES FOREST DISTRICT

Activities	**Treatment Area Goals (ha)**					**Plan 2001/02**	
Stand Tending	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	450	450	450	450	450	24.44	11000
Spacing	415	0	0	0	0	700.00	290500
Pruning	0	0	10	0	0	0.00	0
Fertilizing	0	0	33	13	0	0.00	0
Other	0	0	0	0	0	0.00	0
Totals hectares	865	450	493	463	450	348.55	301,500
Planning and prescriptions							135,000
Total dollars							436,500

Forest Health Enhancement

Spacing	0	0	0	0	0	0.00	0
Pruning	100	100	100	100	100	1,200.00	120000
Other treatments	0	0	0	0	0	0.00	0
Totals hectares	100	100	100	100	100	1,199.98	120,000

Habitat Supply and Biodiversity Enhancement

Treatments	0	0	0	0	0	0.00	0

Domestic Range

Treatments	0	0	0	0	0	0.00	0

Enhanced Forestry Activities - Management Unit Total

Surveys	450	450	450	450	450	24.44	11,000
Spacing	415	0	0	0	0	700.00	290,500
Pruning	100	100	110	100	100	1,199.99	120,000
Fertilizing	0	0	33	13	0	0.00	0
Other stand tending activities	0	0	0	0	0	0.00	0
Totals hectares	965	550	593	563	550	436.78	421,500
Planning and prescriptions							135,000
Studies funding							36120
Total dollars							592,620

2.8.1.6 MACKENZIE FOREST DISTRICT

Activities	**Treatment Area Goals (ha)**					**Plan 2001/02**	
Stand Tending	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	50	50	50	50	50	40.00	2000
Spacing	50	50	50	50	50	1000.00	50000
Pruning	0	0	0	0	0	0.00	0
Fertilizing	0	0	0	0	0	0.00	0
Other (tactical Planning)*	3000	3000	3000	3000	3000	16.67	50,000
Totals hectares	3100	3100	3100	3100	3100	32.90	102,000
Planning and prescriptions							0
Total dollars							102,000

*includes an annual funding commitment of $25000 for fertilization and $25000 for pine rusts tactical studies

Forest Health Enhancement

	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Spacing	0	0	0	0	0	0.00	0
Pruning	0	0	0	0	0	0.00	0
Other treatments	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0

Habitat Supply and Biodiversity Enhancement

	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Treatments*	100	100	100	100	100	500.00	50000

*Adaptive Enhancement of Early Winter Habitat for Northern Caribou Through the Use of alternative silviculture (Slocan Forest Products Ltd.)

Domestic Range

	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Treatments	0	0	0	0	0	0.00	0

Enhanced Forestry Activities - Management Unit Total

	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	50	50	50	50	50	40.00	2,000
Spacing	50	50	50	50	50	999.98	50,000
Pruning	0	0	0	0	0	0.00	0
Fertilizing	0	0	0	0	0	0.00	0
Other stand tending activities	3100	3100	3100	3100	3100	32.26	100000
Totals hectares	3200	100	100	100	100	47.50	152,000
Planning and prescriptions							0
Studies funding							0
Total dollars							152,000

* See Woodlot Table for additional silviculture works which have not been included in the above table.

2.8.1.7 MACKENZIE WOODLOT ASSOCIATION

Activities	Treatment Area Goals (ha)					Plan 2001/02	
Stand Tending	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	0	0	0	0	0	0.00	0
Spacing	0	23	0	0	0	0.00	0
Pruning	0	7	0	0	0	0.00	0
Fertilizing	0	0	0	0	0	0.00	0
Other	0	0	0	0	0	0.00	0
Totals hectares	0	30	0	0	0	0.00	0
Planning and prescriptions	3660	3660	3660	3660	3660		3660
Total dollars		34160					3,660

Forest Health Enhancement

Spacing	0	0	0	0	0	0.00	0
Pruning	0	0	0	0	0	0.00	0
Other treatments	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0

Habitat Supply and Biodiversity Enhancement

Treatments	0	0	0	0	0	0.00	0

Domestic Range

Treatments	0	0	0	0	0	0.00	0

Enhanced Forestry Activities - Management Unit Total

Surveys	0	0	0	0	0	0.00	0
Spacing	0	23	0	0	0	0.00	0
Pruning	0	7	0	0	0	0.00	0
Fertilizing	0	0	0	0	0	0.00	0
Other stand tending activities	0	0	0	0	0	0.00	0
Totals hectares	0	30	0	0	0	0.00	0
Planning and prescriptions							3,660
Studies funding							0
Total dollars	3000	31000	3000	3000	3000		3,660

2.8.1.8 DAWSON CREEK FOREST DISTRICT

Activities	**Treatment Area Goals (ha)**					**Plan 2001/02**	
Stand Tending	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	0	0	0	0	0	0.00	0
Spacing	0	0	0	0	0	0.00	0
Pruning	0	0	0	0	0	0.00	0
Fertilizing	0	0	0	0	0	0.00	0
Other	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0
Planning and prescriptions	0						0
Total dollars	0						0
Forest Health Enhancement							
Spacing	0	0	0	0	0	0.00	0
Pruning	0	0	0	0	0	0.00	0
Other treatments	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0
Habitat Supply and Biodiversity Enhancement							
Treatments	0	0	0	0	0	0.00	0
Domestic Range							
Treatments	0	0	0	0	0	0.00	0
Enhanced Forestry Activities - Management Unit Total							
Surveys	0	0	0	0	0	0.00	0
Spacing	0	0	0	0	0	0.00	0
Pruning	0	0	0	0	0	0.00	0
Fertilizing	0	0	0	0	0	0.00	0
Other stand tending activities	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0
Planning and prescriptions							0
Studies funding							0
Total dollars							0

2.8.1.9 FORT ST. JOHN FOREST DISTRICT

Activities	**Treatment Area Goals (ha)**					**Plan 2001/02**	
Stand Tending	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	0	0	0	0	0	0.00	0
Spacing	0	0	0	0	0	0.00	0
Pruning	0	0	0	0	0	0.00	0
Fertilizing	0	0	0	0	0	0.00	0
Other	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0
Planning and prescriptions							0
Total dollars							0

Forest Health Enhancement

Spacing	0	0	0	0	0	0.00	0
Pruning	0	0	0	0	0	0.00	0
Other treatments	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0

Habitat Supply and Biodiversity Enhancement

Treatments	0	0	0	0	0	0.00	0

Domestic Range

Treatments	0	0	0	0	0	0.00	0

Enhanced Forestry Activities - Management Unit Total

Surveys	0	0	0	0	0	#DIV/0!	0
Spacing	0	0	0	0	0	0.00	0
Pruning	0	0	0	0	0	0.00	0
Fertilizing	0	0	0	0	0	0.00	0
Other stand tending activities	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0
Planning and prescriptions							0
Studies funding							0
Total dollars							0

2.8.1.10 FORT NELSON FOREST DISTRICT

Activities	**Treatment Area Goals (ha)**					**Plan 2001/02**	
Stand Tending	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	0	0	0	0	0	0.00	0
Spacing	0	0	0	0	0	0.00	0
Pruning	0	0	0	0	0	0.00	0
Fertilizing	0	0	0	0	0	0.00	0
Other	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0
Planning and prescriptions							0
Total dollars							0

Forest Health Enhancement

Spacing	0	0	0	0	0	0.00	0
Pruning	0	0	0	0	0	0.00	0
Other treatments	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0

Habitat Supply and Biodiversity Enhancement

Treatments	0	0	0	0	0	0.00	0

Domestic Range

Treatments	0	0	0	0	0	0.00	0

Enhanced Forestry Activities - Management Unit Total

Surveys	0	0	0	0	0	0.00	0
Spacing	0	0	0	0	0	0.00	0
Pruning	0	0	0	0	0	0.00	0
Fertilizing	0	0	0	0	0	0.00	0
Other stand tending activities	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0
Planning and prescriptions							0
Studies funding							0
Total dollars							0

2.8.2 BACKLOG PROGRAM TABLES

2.8.2.1 PRINCE GEORGE FOREST DISTRICT

Activities	Treatment Area Goals (ha)					Plan 2001/02	
Legal Obligations	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	500	500	1000	1000	1000	25.00	12500
Site preparation	0	0	0	0	0	0.00	
Planting	100	100	100	100	100	450.00	45000
Brushing	200	200	200	200	200	700.00	140000
Max. density spacing	0	0	0	0	0	0.00	
Totals hectares	800	800	1300	1300	1300	246.87	197,500
Seedling purchase (in ha required)	100	100	100	100	100	450.00	45000
Total legal obligations							242,500
Backlog Reforestation							
Surveys	20000	18000	12000	7000	7000	30.00	600000
Site preparation	500	500	500	500	500	800.00	400000
Planting	600	600	600	400	300	500.00	300000
Brushing	500	500	500	500	500	650.00	325000
Totals hectares	21600	19600	13600	8400	8300	75.23	1,625,000
Seedling purchase (in ha required)	600	600	600	400	300	450.00	270,000
Prescriptions and planning dollars							200,000
Total backlog reforestation							2,095,000
Impeded areas							
Surveys	15000	10000	5000	4000	4000	25.00	375000
Brushing	4000	4000	4000	2000	2000	700.00	2800000
Density spacing	0	0	0	0	0	0.00	0
Totals hectares	19000	14000	9000	6000	6000	167.11	3,175,000
Prescriptions and planning dollars							200,000
Total impeded areas							3,375,000
Site Restoration							
Fill planting	0	0	0	0	0	0.00	0
Rehabilitation	0	0	0	0	0	0.00	0
Reforestation	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0
Seed purchase	0	0	0	0	0	0.00	0
Prescriptions and planning dollars							0
Total site restoration							0
Backlog Program Activities - Management Unit Total							
Surveys	35500	28500	18000	12000	12000	27.82	987500
Site preparation	500	500	500	500	500	800.00	400000
Planting	700	700	700	500	400	492.86	345000
Brushing	4700	4700	4700	2700	2700	694.68	3265000
Density spacing	0	0	0	0	0	0.00	0
Totals hectares	41400	34400	23900	15700	15600	120.71	4997500
(in ha required)	700	700	700	500	400	450.00	315000
Prescriptions and planning							400,000
Recommended studies							175,000
Total backlog program							5,887,500

2.8.2.2 PRINCE GEORGE WOODLOT ASSOCIATION

Activities	Treatment Area Goals (ha)					Plan 2001/02	
Legal Obligations	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	0	0	0	0	0	0.00	0
Site preparation	0	0	0	0	0	0.00	0
Planting	0	0	0	0	0	0.00	0
Brushing	0	0	0	0	0	0.00	0
Max. density spacing	50	50	50	50	50	1,200.00	60000
Totals hectares	50	50	50	50	50	1,199.90	60,000
Seed purchase	0	0	0	0	0	0.00	0
Total legal obligations							60,000

Backlog Reforestation

Surveys	1000	800	800	600	600	30.00	30000
Site preparation	100	100	50	50	50	500.00	50000
Planting	150	150	150	150	150	500.00	75000
Brushing	400	400	400	300	300	800.00	320000
Totals hectares	1650	1450	1400	1100	1100	287.88	475,000
Seed purchase	0	0	0	0	0	0.00	0
Prescriptions and planning dollars						$42,000	42,000
Total backlog reforestation							517,000

Impeded areas

Surveys	0	0	0	0	0	0.00	0
Brushing	0	0	0	0	0	0.00	0
Density spacing	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0
Prescriptions and planning dollars							0
Total impeded areas							0

Site Restoration

Fill planting	0	0	0	0	0	0.00	0
Rehabilitation	0	0	0	0	0	0.00	0
Reforestation	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0
Seed purchase	0	0	0	0	0	0.00	0
Prescriptions and planning dollars							0
Total site restoration							0

Backlog Program Activities - Management Unit Total

Surveys	1000	800	800	600	600	30.00	30000
Site preparation	100	100	50	50	50	499.99	50000
Planting	150	150	150	150	150	499.99	75000
Brushing	400	400	400	300	300	800.00	320000
Density spacing	50	50	50	50	50	1,199.98	60000
Totals hectares	1700	1500	1450	1150	1150	314.70	535000
Seed purchase	0	0	0	0	0	0.00	0
Prescriptions and planning							42,000
Recommended studies							0
Total backlog program							577,000

* Seed purchase includes seedlings purchase. Units are number of seedlings, or specify.

2.8.2.3 ROBSON VALLEY FOREST DISTRICT

Activities	Treatment Area Goals (ha)					Plan 2001/02	
Legal Obligations	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	0	30	50	50	50	25.00	0
Site preparation	0	0	0	0	0	0.00	0
Planting	0	0	0	0	0	0.00	0
Brushing	0	0	30	50	50	1,000.00	0
Max. density spacing	0	0	0	0	0	0.00	0
Totals hectares	0	30	80	100	100	0.00	0
Seedling purchase	0	0	0	0	0	0.00	0
Total legal obligations							0

Backlog Reforestation

Surveys	1200	200	100	0	0	22.00	26400
Site preparation	30	50	50	50	50	800.00	24000
Planting	30	50	50	50	50	400.00	12000
Brushing	0	30	50	50	50	1,000.00	0
Totals hectares	1260	330	250	150	150	49.52	62,400
Seedling purchase(in seedlings required)	25000	0	0	0	0	0.35	8,750
Prescriptions and planning dollars							6,240
Total backlog reforestation							68,640

Impeded areas

Surveys	2200	2600	3000	1300	900	25.00	55000
Brushing	200	200	200	200	200	1,000.00	200000
Density spacing	0	0	0	0	0	0.00	0
Totals hectares	2400	2800	3200	1500	1100	106.25	255,000
Prescriptions and planning dollars							22,500
Total impeded areas							277,500

Site Restoration

Fill planting	30	30	30	30	30	400.00	12000
Rehabilitation	30	30	30	30	30	550.00	16500
Reforestation	0	30	30	30	30	400.00	0
Totals hectares	60	90	90	90	90	474.99	28,500
Seedling purchase	0	0	0	0	0	0.00	0
Prescriptions and planning dollars							2,850
Total site restoration							31,350

Backlog Program Activities - Management Unit Total

Surveys	3400	2830	3150	1350	950	23.94	81400
Site preparation	60	80	80	80	80	674.99	40500
Planting	60	110	110	110	110	399.99	24000
Brushing	200	230	280	300	300	999.99	200000
Density spacing	0	0	0	0	0	0.00	0
Totals hectares	3720	3250	3620	1840	1440	92.98	345900
Seedling purchase ((in seedlings required)	25000	0	0	0	0	0.35	8,750
Prescriptions and planning							31,590
Recommended studies							0
Total backlog program							386,240

* Seed purchase includes seedlings purchase. Units are number of seedlings, or specify.

2.8.2.4 VANDERHOOF FOREST DISTRICT[15]

Activities	**Treatment Area Goals (ha)**					**Plan 2001/02**	
Legal Obligations	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	246	232	145	147	93	30.00	7380
Site preparation	4	0	0	0	0	900.00	3600
Planting	81	4	0	0	0	550.00	44550
Brushing	0	0	6	0	0	650.00	1
Max. density spacing	83	0	0	0	0	650.00	53950
Totals hectares	414	236	151	147	93	264.45	109,481
Seedling purchase	0	0	0	0	0	0.00	0
Total legal obligations							109,481
Backlog Reforestation							
Surveys	2500	2118	171	52	17	30.00	75000
Site preparation	79	0	0	0	0	900.00	71100
Planting	186	79	53	0	0	550.00	102300
Brushing	0	0	0	0	0	0.00	0
Totals hectares	2765	2197	224	52	17	89.84	248,400
Seedling purchase	0	0	0	0	0	0.00	0
Prescriptions and planning dollars							0
Total backlog reforestation							248,400
Impeded areas							
Surveys	10000	5537	2261	890	806	30.00	300000
Brushing	300	11	31	13	2	650.00	195000
Density spacing	500	320	0	0	121	650.00	325000
Totals hectares	10800	5868	2292	903	929	75.93	820,000
Prescriptions and planning dollars							0
Total impeded areas							820,000
Site Restoration							
Fill planting	0	0	0	0	0	0.00	0
Rehabilitation	0	0	0	0	0	0.00	0
Reforestation	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0
Seedling purchase	0	0	0	0	0	0.00	0
Prescriptions and planning dollars							0
Total site restoration							0
Backlog Program Activities - Management Unit Total							
Surveys	12746	7687	2577	1089	916	30.00	382380
Site preparation	83	0	0	0	0	899.99	74700
Planting	267	83	53	0	0	550.00	146850
Brushing	300	11	37	13	2	650.00	195001
Density spacing	583	320	0	0	121	650.00	378950
Totals hectares	13979	8301	2667	1102	1039	84.26	1177881
Seedling purchase	0	0	0	0	0	0.00	0
Prescriptions and planning							0
Recommended studies							52,000
Total backlog program							1,229,881

* Seed purchase includes seedlings purchase. Units are number of seedlings, or specify.

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[15] The Stuart Nechako Woodlot Association SH Activities are included in this District submission. Licensees of this organization will be implementing 200 ha of silvicultural surveys, 75 ha of backlog planting and 300 ha of impeded stand brushing during 2001/02.

2.8.2.5 FORT ST. JAMES FOREST DISTRICT

Activities	**Treatment Area Goals (ha)**					**Plan 2001/02**	
Legal Obligations	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	540	469	350	275	150	23.00	12420
Site preparation	265	440	369	250	75	1,100.00	291500
Planting	50	75	150	150	150	300.00	15000
Brushing	50	35	25	0	0	750.00	37500
Max. density spacing	357	625	635	625	625	700.00	250000
Totals hectares	1262	1644	1529	1300	1000	282.44	606420
Seedling purchase (in #'s required)	200000	0	0	0	0	0.37	74,000
Total legal obligations							680,420
Backlog Reforestation							
Surveys	2820	2845	1400	1200	1200	23.00	64860
Site preparation	0	0	0	0	0	0.00	0
Planting	579	569	590	245	240	300.00	173700
Brushing		0	0	0	0		0
Totals hectares	3399	3414	1990	1445	1440	70.19	238,560
Seedling purchase (in #'s required)	1000000	0	0	0	0	0.37	370,000
Prescriptions and planning dollars							65,000
Total backlog reforestation							340,560
Impeded areas							
Surveys	7690	7000	7000	6000	6000	23.00	176870
Brushing	3095	2530	2150	1500	1000	750.00	2321250
Density spacing	0	0	0	0	0	0.00	0
Totals hectares	10785	9530	9150	7500	7000	231.63	2,498,120
Prescriptions and planning dollars							177,000
Total impeded areas							2,675,120
Site Restoration							
Fill planting	0	0	0	0	0	0.00	0
Rehabilitation	0	0	0	0	0	0.00	0
Reforestation	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0
Seedling purchase	0	0	0	0	0	0.00	0
Prescriptions and planning dollars							0
Total site restoration							0
Backlog Program Activities - Management Unit Total							
Surveys	11050	10314	8750	7475	7350	23.00	254150
Site preparation	265	440	369	250	75	1,099.99	291500
Planting	629	644	740	395	390	300.00	188700
Brushing	3145	2565	2175	1500	1000	750.00	2358750
Density spacing	357	625	635	625	625	0.06	250000
Totals hectares	15446	14588	12669	10245	9440	200.25	3343100
Seedling purchase (in #'s required)	300000	0	0	0	0	0.37	111,000
Prescriptions and planning							242,000
Recommended studies							35,000
Total backlog program							3,731,100

* Seed purchase includes seedlings purchase. Units are number of seedlings, or specify.

2.8.2.6 MACKENZIE FOREST DISTRICT

Activities	Treatment Area Goals (ha)					Plan 2001/02	
Legal Obligations	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	0	0	0	0	0	0.00	0
Site preparation	100	0	0	0	0	800.00	80000
Planting	150	50	0	0	0	700.00	105000
Brushing	500	1000	500	0	0	800.00	400000
Max. density spacing	0	0	0	0	0	0.00	0
Totals hectares	750	1050	500	0	0	780.00	585,000
Seedling purchase	150	0	0	0	0	173.33	26000
Total legal obligations							611,000
Backlog Reforestation							
Surveys							
Site preparation	0	0	0	0	0	0.00	0
Planting	0	0	0	0	0	0.00	0
Brushing							
Totals hectares	0	0	0	0	0	0.00	0
Seedling purchase	0	0	0	0	0	0.00	0
Prescriptions and planning dollars							0
Total backlog reforestation							0
Impeded areas							
Surveys	6500	6500	6500	6500	6500	30.00	195,000
Brushing	2000	2500	2500	2500	2500	700.00	1,400,000
Density spacing	0	0	0	0	0	0.00	0
Totals hectares	8500	9000	9000	9000	9000	211.18	1,595,000
Prescriptions and planning dollars							200,000
Total impeded areas							1,795,000
Site Restoration							
Fill planting	0	0	0	0	0	0.00	0
Rehabilitation	0	0	0	0	0	0.00	0
Reforestation	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0
Seedling purchase	0	0	0	0	0	0.00	0
Prescriptions and planning dollars							0
Total site restoration							0
Backlog Program Activities - Management Unit Total							
Surveys	6500	6500	6500	6500	6500	30.00	195,000
Site preparation	100	0	0	0	0	799.98	80,000
Planting	150	50	0	0	0	699.99	105,000
Brushing	2500	3500	3000	2500	2500	720.00	1,800,000
Density spacing	0	0	0	0	0	0.00	0
Totals hectares	9250	10050	9500	9000	9000	257.30	2,380,000
Seedling purchase (in ha required)	150	0	0	0	0	173.33	26,000
Prescriptions and planning							200,000
Recommended studies (Tactical Planning)**							40,000
Total backlog program							2,446,000

**RMP Strategy 2 - Pre'87 Impeded Stand Interventions - Recommended Tacticts suggests annual commitment of $40000 for innovative tactical planning

2.8.2.7 MACKENZIE WOODLOT ASSOCIATION

Activities	Treatment Area Goals (ha)					Plan 2001/02	
Legal Obligations	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	0	0	0	0	0	0.00	0
Site preparation	0	0	0	0	0	0.00	0
Planting	0	0	0	0	0	0.00	0
Brushing	0	0	0	0	0	0.00	0
Max. density spacing	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0
Seedling purchase	0	0	0	0	0	0.00	0
Total legal obligations							0
Backlog Reforestation							
Surveys	155	0	0	0	0	64.20	9951
Site preparation	58	0	0	0	0	1,202.36	70218
Planting	58	0	0	0	0	561.95	32818
Brushing	51	0	0	0	0	1,055.47	54040
Totals hectares	323	0	0	0	0	517.11	167,027
Seedling purchase	0	0	0	0	0	0.00	0
Prescriptions and planning dollars							0
Total backlog reforestation							167,027
Impeded areas							
Surveys	0	0	0	0	0	0.00	0
Brushing	0	0	0	0	0	0.00	0
Density spacing	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0
Prescriptions and planning dollars							0
Total impeded areas							0
Site Restoration							
Fill planting	0	0	0	0	0	0.00	0
Rehabilitation	0	0	0	0	0	0.00	0
Reforestation	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0
Seedling purchase	0	0	0	0	0	0.00	0
Prescriptions and planning dollars							0
Total site restoration							0
Backlog Program Activities - Management Unit Total							
Surveys	155	0	0	0	0	64.20	9951
Site preparation	58	0	0	0	0	1,202.34	70218
Planting	58	0	0	0	0	561.93	32818
Brushing	51	0	0	0	0	1,055.45	54040
Density spacing	0	0	0	0	0	0.00	0
Totals hectares	323	0	0	0	0	517.10	167027
Seedling purchase	0	0	0	0	0	0.00	0
Prescriptions and planning							0
Recommended studies							0
Total backlog program							167,027

* Seed purchase includes seedlings purchase. Units are number of seedlings, or specify.

2.8.2.8 DAWSON CREEK FOREST DISTRICT

Activities	**Treatment Area Goals (ha)**					**Plan 2001/02**	
Legal Obligations	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	1468	1007	1228	1200	1200	24.52	36000
Site preparation	500	508	525	0	0	500.00	250000
Planting	742	526	515	549	100	498.65	370000
Brushing	700	1242	1700	1700	1200	450.00	315000
Max. density spacing	0	0	0	0	0	00.00	0
Totals hectares	3410	3283	3968	3449	2500	284.75	971,000
Seedling purchase	0	0	0	0	0	0.00	0.00
Total legal obligations							971,000
Backlog Reforestation							
Surveys	8387	8387	2873	6805	3022	30.00	251600
Site preparation	237	237	580	352	0	500.00	118500
Planting	850	850	894	1031	515	500.00	425000
Brushing	1073	1073	1070	0	0	600.19	644000
Totals hectares	10547	10547	5417	8188	3537	136.45	1,439,100
Seedling purchase (in ha required)	850	850	894	1031	515	249.41	212,000
Prescriptions and planning dollars							0
Total backlog reforestation							1,651,100
Impeded areas							
Surveys	8256	8256	3957	4716	4048	30.04	248000
Brushing	1712	1712	1645	540	99	598.13	1024000
Density spacing	0	0	0	0	0	0.00	0
Totals hectares	9968	9968	5602	5256	4147	127.61	1,272,000
Prescriptions and planning dollars							0
Total impeded areas							1,272,000
Site Restoration							
Fill planting	0	0	0	0	0	0.00	0
Rehabilitation	0	0	0	0	0	0.00	0
Reforestation	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0
Seedling purchase	0	0	0	0	0	0.00	0
Prescriptions and planning dollars							0
Total site restoration							0
Backlog Program Activities - Management Unit Total							
Surveys	18111	17650	8058	12721	8270	29.57	535600
Site preparation	737	745	1105	352	0	500.00	368500
Planting	1592	1376	1409	1580	615	499.37	795000
Brushing	3485	4027	4415	2240	1299	569.01	1983000
Density spacing	0	0	0	0	0	0.00	0
Totals hectares	23925	23798	14987	16893	10184	153.90	3682100
Seedling purchase (in ha required)	850	850	894	1031	515	249.41	212000
Prescriptions and planning							0
Recommended studies	50000						50,000
Total backlog program							3,944,100

2.8.2.9 FORT ST. JOHN FOREST DISTRICT

Activities	Treatment Area Goals (ha)					Plan 2001/02	
Legal Obligations	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	1740	1740	1740	1740	1740	25.86	45000
Site preparation	0	0	0	0	0	0.00	0
Planting	150	0	0	0	0	366.67	55000
Brushing	200	200	200	200	200	400.00	80000
Max. density spacing	0	0	0	0	0	0.00	0
Totals hectares	2090	1940	1940	1940	1940	86.12	180,000
Seedling purchase (in ha required)	150	150	150	150	150	360.00	54,000
Total legal obligations							234,000

Backlog Reforestation

Surveys	2880	2880	2880	2880	2880	34.72	100000
Site preparation	1000	1000	1000	1000	1000	360.00	360000
Planting	850	1000	1000	1000	1000	335.29	285000
Brushing	0	0	0	0	0	0.00	0
Totals hectares	4730	4880	4880	4880	4880	157.51	745,000
Seedling purchase (in ha required)	850	850	850	850	850	360.00	306,000
Prescriptions and planning dollars							0
Total backlog reforestation							1,051,000

Impeded areas

Surveys	2880	2880	2880	2880	2880	34.72	100000
Brushing	1815	1815	1815	1815	1815	650.14	1180000
Density spacing	0	0	0	0	0	0.00	0
Totals hectares	4695	4695	4695	4695	4695	272.63	1,280,000
Prescriptions and planning dollars							0
Total impeded areas							1,280,000

Site Restoration

Fill planting	0	0	0	0	0	0.00	0
Rehabilitation	0	0	0	0	0	0.00	0
Reforestation	0	0	0	0	0	0.00	0
Totals hectares	0	0	0	0	0	0.00	0
Seedling purchase	0	0	0	0	0	0.00	0
Prescriptions and planning dollars							0
Total site restoration							0

Backlog Program Activities - Management Unit Total

Surveys	7500	7500	7500	7500	7500	32.67	245000
Site preparation	1000	1000	1000	1000	1000	360.00	360000
Planting	1000	1000	1000	1000	1000	340.00	340000
Brushing	2015	2015	2015	2015	2015	625.31	1260000
Density spacing	0	0	0	0	0	0.00	0
Totals hectares	11515	11515	11515	11515	11515	191.49	2205000
Seedkling purchase (in ha required)	100000	100000	100000	100000	100000	360.00	360,000
Prescriptions and planning							0
Recommended studies							0
Total backlog program							2,565,000

2.8.2.10 FORT NELSON FOREST DISTRICT

Activities	**Treatment Area Goals (ha)**					**Plan 2001/02**	
Legal Obligations	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	790	544	554	333	723	40.00	31600
Site preparation	0	0	0	0	0	0.00	0
Planting	256	0	0	0	0	998.05	255500
Brushing	169	208	425	11	113	550.00	92950
Max. density spacing	0	0	0	0	0	0.00	0
Totals hectares	1215	752	979	344	836	312.80	380,050
Seedling purchase (in ha required)	256	0	0	0	0	798.44	204,400
Total legal obligations							584,450

Backlog Reforestation

	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	965	523	650	340	340	42.82	41320
Site preparation	150	100	100	100	100	700.00	105000
Planting	438	378	200	200	200	572.92	250940
Brushing	331	230	274	268	246	550.00	182050
Totals hectares	1884	1231	1224	908	886	307.49	579,310
Seedling purchase (in ha required)	438	378	200	200	200	228.31	100,000
Prescriptions and planning dollars							0
Total backlog reforestation							679,310

Impeded areas

	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	4000	3000	3000	3000	3000	48.00	192000
Brushing	1300	1300	1300	1300	1300	550.00	715000
Density spacing	0	0	0	0	0	0.00	0
Totals hectares	5300	4300	4300	4300	4300	171.13	907,000
Prescriptions and planning dollars							0
Total impeded areas							907,000

Site Restoration

	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Fill planting	0	0	0	0	0	0.00	0
Rehabilitation	230	230	230	230	230	700.00	161000
Reforestation	230	230	230	230	230	100.00	23000
Totals hectares	460	460	460	460	460	400.00	184,000
Seedling purchase (in ha required)	230	230	230	230	230	973.91	224,000
Prescriptions and planning dollars							14,400
Total site restoration							422,400

Backlog Program Activities - Management Unit Total

	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Surveys	5755	4067	4204	3673	4063	46.03	264920
Site preparation	380	330	330	330	330	700.00	266000
Planting	924	608	430	430	430	572.99	529440
Brushing	1800	1738	1999	1579	1659	550.00	990000
Density spacing	0	0	0	0	0	0.00	0
Totals hectares	8859	6743	6963	6012	6482	231.44	2050360
Seeding purchase (in ha required)	924	608	430	430	430	571.86	528400
Prescriptions and planning							14,400
Recommended studies							0
Total backlog program							2,593,160

2.8.3 FOREST RENEWAL PERFORMANCE MEASURES 2001/2002

2.8.3.1 PRINCE GEORGE FOREST DISTRICT

	Performance Measure	Tree Improve-ment	Nursery Seedling Production	Silv. Survey	Site prep.	Backlog Plant	Brush	Space	Prune	Fertilize	Support staff and admin	Totals
	Inputs											
A	**Planned treatment area (ha) in 2001/2002**	700	0	27,375	500	700	4,700	300	50	600	34,925	
1.0	**Timber Supply**											
1.1	Potential volume/ha gain (m3/ha/yr)	0.34	0	0.25	0	1.9	0.25	0	0	0.40		
1.2	Years the factor will apply	80	65	65	65	80	80	80	65	65		
1.3	Pot. total merch. volume increment in 65 years (m3)	19,040	0	444,844	0	106,400	94,000	0	0	15,600		**679,884**
1.4	Est. yrs reduced to achieve management objectives	5-10	1-3	5-10	0	5-20	5	5-30	0	5-10		
1.4	Est. area that will be reclassified as stocked (ha)			5,000								**5,000**
1.5	Est. area that will be declared as free growing (ha)			20,000								**20,000**
2.0	**Wood Value**											
2.1	Percent improvement in total value at harvest (Compared to no treatment)							10	15	3		
3.0	**Employment**											
3.1	Estimated short term employment (person days/ha)	0.1	0.34	0.05	0.5	0.6	3	3	3.5	0.1	0.1	
3.2	Estimated total employment (person days/year)	70	0	1,369	250	420	14,100	900	175	60	3,493	
3.3	Estimated total full time equivalent positions (FTE)	0	0	8	1	2	78	5	1	0	19	**116**
4.1	**Forest Health Enhancement (ha)**											**0**
5.1	**Habitat Supply**											
5.2	Planned area for specific wildlife forage or habitat creation in 2001/2002 (ha)											**0**
5.3	Est. area with secondary value provided to biodiversity (ha)											**500**

2.8.3.2 PRINCE GEORGE WOODLOT ASSOCIATION

	Performance Measure	Tree Improve-ment	Nursery Seedling Production	Silv. Survey	Site prep.	Backlog Plant	Brush	Space	Prune	Fertilize	Support staff and admin	Totals
	Inputs											
A	**Planned treatment area (ha) in 2001/2002**	150	0	330	100	150	400	100	0	0	1,230	
1.0	**Timber Supply**											
1.1	Potential volume/ha gain (m3/ha/yr)	0.34	0	0.25	0	1.9	0.25	0	0	0.40		
1.2	Years the factor will apply	65	65	65	65	65	65	65	65	65		
1.3	Pot. total merch. volume increment in 65 years (m3)	3,315	0	5,363	0	18,525	6,500	0	0	0		**33,703**
1.4	Est. yrs reduced to achieve management objectives	5-10	1-3	5-10	0	5-20	5	5-30	0	5-10		
1.4	Est. area that will be reclassified as stocked (ha)			200								**200**
1.5	Est. area that will be declared as free growing (ha)			0								**0**
2.0	**Wood Value**											
2.1	Percent improvement in total value at harvest (Compared to no treatment)							5-15%	15-30%	1-5%		
3.0	**Employment**											
3.1	Estimated short term employment (person days/ha)	0.1	0.34	0.1	0.95	2	2.61	3.96	4.54	0.18	0.1	
3.2	Estimated total employment (person days/year)	15	0	33	95	300	1,044	396	0	0	123	
3.3	Estimated total full time equivalent positions (FTE)	0	0	0	1	2	6	2	0	0	1	**11**
4.1	**Forest Health Enhancement (ha)**											**0**
5.1	**Habitat Supply**											
5.2	Planned area for specific wildlife forage or habitat creation in 2001/2002 (ha)											**0**
5.3	Est. area with secondary value provided to biodiversity (ha)											**0**

2.8.3.3 ROBSON VALLEY FOREST DISTRICT

	Performance Measure	Tree Improvement	Nursery Seedling Production	Silv. Survey	Site prep.	Backlog Plant	Brush	Space	Prune	Fertilize	Support staff and admin	Totals
	Inputs											
A	**Planned treatment area (ha) in 2001/2002**	636	636	3,500	60	60	200	50	20	0	5,162	
1.0	**Timber Supply**											
1.1	Potential volume/ha gain (m3/ha/yr)	0.34	0	0.25	0	1.9	0.25	0	0	0.40		
1.2	Years the factor will apply	65	65	65	65	65	65	65	65	65		
1.3	Pot. total merch. volume increment in 65 years (m3)	14,056	0	56,875	0	7,410	3,250	0	0	0		**81,591**
1.4	Est. yrs reduced to achieve management objectives	5-10	1-3	5-10	0	5-20	5	5-30	0	5-10		
1.4	Est. area that will be reclassified as stocked (ha)			525								**525**
1.5	Est. area that will be declared as free growing (ha)			2,800								**2,800**
2.0	**Wood Value**											
2.1	Percent improvement in total value at harvest (Compared to no treatment)							5-15%	15-30%	1-5%		
3.0	**Employment**											
3.1	Estimated short term employment (person days/ha)	0.1	0.34	0.1	1	1.3	2	3	4.54	0.18	0.1	
3.2	Estimated total employment (person days/year)	64	216	350	60	78	400	150	91	0	516	
3.3	Estimated total full time equivalent positions (FTE)	0	1	2	0	0	2	1	1	0	3	**11**
4.1	**Forest Health Enhancement (ha)**											**0**
5.1	**Habitat Supply**											
5.2	Planned area for specific wildlife forage or habitat creation in 2001/2002 (ha)											**0**
5.3	Est. area with secondary value provided to biodiversity (ha)											**0**

2.8.3.4 VANDERHOOF FOREST DISTRICT

	Performance Measure	Tree Improve-ment	Nursery Seedling Production	Silv. Survey	Site prep.	Backlog Plant	Brush	Space	Prune	Fertilize	Support staff and admin	Totals
	Inputs											
A	**Planned treatment area (ha) in 2001/2002**	267	0	4,543	83	267	300	1,201	100	350	7,111	
1.0	**Timber Supply**											
1.1	Potential volume/ha gain (m3/ha/yr)	0.34	0	0.25	0	1.9	0.25	0	0	0.40		
1.2	Years the factor will apply	65	65	65	65	65	65	65	65	65		
1.3	Pot. total merch. volume increment in 65 years (m3)	5,901	0	73,820	0	32,975	4,875	0	0	9,100		**126,671**
1.4	Est. yrs reduced to achieve management objectives	5-10	1-3	5-10	0	5-20	5	5-30	0	5-10		
1.4	Est. area that will be reclassified as stocked (ha)			1,875								**1,875**
1.5	Est. area that will be declared as free growing (ha)			7,500								**7,500**
2.0	**Wood Value**											
2.1	Percent improvement in total value at harvest (Compared to no treatment)							5-15%	15-30%	1-5%		
3.0	**Employment**											
3.1	Estimated short term employment (person days/ha)	0.1	0.34	0.1	1	2	2.5	3	4.5	0.05	0.1	
3.2	Estimated total employment (person days/year)	27	0	454	83	534	750	3,603	450	18	711	
3.3	Estimated total full time equivalent positions (FTE)	0	0	3	0	3	4	20	3	0	4	**37**
4.1	**Forest Health Enhancement (ha)**											**0**
5.1	**Habitat Supply**											
5.2	Planned area for specific wildlife forage or habitat creation in 2001/2002 (ha)											**0**
5.3	Est. area with secondary value provided to biodiversity (ha)											**0**

2.8.3.5 FORT ST. JAMES FOREST DISTRICT

	Performance Measure	Tree Improvement	Nursery Seedling Production	Silv. Survey	Site prep.	Backlog Plant	Brush	Space	Prune	Fertilize sanitation	Support staff and admin	Totals
	Inputs											
A	**Planned treatment area (ha) in 2001/2002**	629	187	3,795	265	629	3,145	772	100	0	9,522	
1.0	**Timber Supply**											
1.1	Potential volume/ha gain (m3/ha/yr)	0.34	0	0.25	0	1.9	0.25	0	0	0.40		
1.2	Years the factor will apply	65	65	65	65	65	65	65	65	65		
1.3	Pot. total merch. volume increment in 65 years (m3)	13,901	0	61,669	0	77,682	51,106	0	0	0		**204,358**
1.4	Est. yrs reduced to achieve management objectives	5-10	1-3	5-10	0	5-20	5	5-30	0	5-10		
1.4	Est. area that will be reclassified as stocked (ha)			1,244								**1,244**
1.5	Est. area that will be declared as free growing (ha)			2,000								**2,000**
2.0	**Wood Value**											
2.1	Percent improvement in total value at harvest (Compared to no treatment)							5-15%	0	1-5%		
3.0	**Employment**											
3.1	Estimated short term employment (person days/ha)	0.1	0.34	0.1	0.95	2	2.61	3.96	4.54	0.18	0.1	
3.2	Estimated total employment (person days/year)	63	64	380	252	1,258	8,208	3,057	454	0	952	
3.3	Estimated total full time equivalent positions (FTE)	0	0	2	1	7	46	17	3	0	5	**82**
4.1	**Forest Health Enhancement (ha)**											**100**
5.1	**Habitat Supply**											
5.2	Planned area for specific wildlife forage or habitat creation in 2001/2002 (ha)											**0**
5.3	Est. area with secondary value provided to biodiversity (ha)											**0**

2.8.3.6

2.8.3.7 MACKENZIE FOREST DISTRICT

	Performance Measure	Tree Improvement	Nursery Seedling Production	Silv. Survey	Site prep.	Backlog Plant	Brush	Space	Prune	Fertilize	Support staff and admin	Totals
	Inputs											
A	**Planned treatment area (ha) in 2001/2002**	150	0	2,162	100	150	2,500	50	0	0	8,212	
1.0	**Timber Supply**											
1.1	Potential volume/ha gain (m3/ha/yr)	0.34	0	0.25	0	1.9	0.25	0	0	0.40		
1.2	Years the factor will apply	65	65	65	65	65	65	65	65	65		
1.3	Pot. total merch. volume increment in 65 years (m3)	3,315	0	35,124	0	18,525	40,625	0	0	0		**97,590**
1.4	Est. yrs reduced to achieve management objectives	5-10	1-3	5-10	0	5-20	5	5-30	0	5-10		
1.4	Est. area that will be reclassified as stocked (ha)			150								**150**
1.5	Est. area that will be declared as free growing (ha)			3,000								**3,000**
2.0	**Wood Value**											
2.1	Percent improvement in total value at harvest (Compared to no treatment)							5-15%	15-30%	1-5%		
3.0	**Employment**											
3.1	Estimated short term employment (person days/ha)	0.1	0.34	0.1	0.95	2	2.61	3.96	4.54	0.18	0.1	
3.2	Estimated total employment (person days/year)	15	0	216	95	300	6,525	198	0	0	821	
3.3	Estimated total full time equivalent positions (FTE)	0	0	1	1	2	36	1	0	0	5	**45**
4.1	**Forest Health Enhancement (ha)**											**0**
5.1	**Habitat Supply**											
5.2	Planned area for specific wildlife forage or habitat creation in 2001/2002 (ha)											**100**
5.3	Est. area with secondary value provided to biodiversity (ha)											**0**

2.8.3.8 MACKENZIE WOODLOT ASSOCIATION

	Performance Measure	Tree Improvement	Nursery Seedling Production	Silv. Survey	Site prep.	Backlog Plant	Brush	Space	Prune	Fertilize	Support staff and admin	Totals
	Inputs											
A	**Planned treatment area (ha) in 2001/2002**	58	0	51	58	58	51	0	0	0	278	
1.0	**Timber Supply**											
1.1	Potential volume/ha gain (m3/ha/yr)	0.34	0	0.25	0	1.9	0.25	0	0	0.40		
1.2	Years the factor will apply	65	65	65	65	65	65	65	65	65		
1.3	Pot. total merch. volume increment in 65 years (m3)	1,291	0	831	0	7,213	832	0	0	0		**10,167**
1.4	Est. yrs reduced to achieve management objectives	5-10	1-3	5-10	0	5-20	5	5-30	0	5-10		
1.4	Est. area that will be reclassified as stocked (ha)			0								**0**
1.5	Est. area that will be declared as free growing (ha)			0								**0**
2.0	**Wood Value**											
2.1	Percent improvement in total value at harvest (Compared to no treatment)							5-15%	15-30%	1-5%		
3.0	**Employment**											
3.1	Estimated short term employment (person days/ha)	0.1	0.34	0.1	0.95	2	2.61	3.96	4.54	0.18	0.1	
3.2	Estimated total employment (person days/year)	6	0	5	55	117	134	0	0	0	28	
3.3	Estimated total full time equivalent positions (FTE)	0	0	0	0	1	1	0	0	0	0	**2**
4.1	**Forest Health Enhancement (ha)**											**0**
5.1	**Habitat Supply**											
5.2	Planned area for specific wildlife forage or habitat creation in 2001/2002 (ha)											**0**
5.3	Est. area with secondary value provided to biodiversity (ha)											**0**

2.8.3.9 DAWSON CREEK FOREST DISTRCIT

	Performance Measure	Tree Improve-ment	Nursery Seedling Production	Silv. Survey	Site prep.	Backlog Plant	Brush	Space	Prune	Fertilize	Support staff and admin	Totals
	Inputs											
A	**Planned treatment area (ha) in 2001/2002**	1,592	0	5,977	737	1,592	3,485	0	0	0	13,383	
1.0	**Timber Supply**											
1.1	Potential volume/ha gain (m3/ha/yr)	0.34	0	0.25	0	1.9	0.25	0	0	0.40		
1.2	Years the factor will apply	65	65	65	65	65	65	65	65	65		
1.3	Pot. total merch. volume increment in 65 years (m3)	35,183	0	97,120	0	196,612	56,631	0	0	0		**385,547**
1.4	Est. yrs reduced to achieve management objectives	5-10	1-3	5-10	0	5-20	5	5-30	0	5-10		
1.4	Est. area that will be reclassified as stocked (ha)			0								**0**
1.5	Est. area that will be declared as free growing (ha)			0								**0**
2.0	**Wood Value**											
2.1	Percent improvement in total value at harvest (Compared to no treatment)							5-15%	15-30%	1-5%		
3.0	**Employment**											
3.1	Estimated short term employment (person days/ha)	0.1	0.34	0.1	0.95	2	2.61	3.96	4.54	0.18	0.1	
3.2	Estimated total employment (person days/year)	159	0	598	700	3,184	9,096	0	0	0	1,338	
3.3	Estimated total full time equivalent positions (FTE)	1	0	3	4	18	51	0	0	0	7	**84**
4.1	**Forest Health Enhancement (ha)**											**0**
5.1	**Habitat Supply**											
5.2	Planned area for specific wildlife forage or habitat creation in 2001/2002 (ha)											**0**
5.3	Est. area with secondary value provided to biodiversity (ha)											**0**

2.8.3.10 FORT ST JOHN FOREST DISTRICT

	Performance Measure	Tree Improve-ment	Nursery Seedling Production	Silv. Survey	Site prep.	Backlog Plant	Brush	Space	Prune	Fertilize	Support staff and admin	Totals
	Inputs											
A	**Planned treatment area (ha) in 2001/2002**	1,000	0	2,475	1,000	1,000	2,015	0	0	0	7,490	
1.0	**Timber Supply**											
1.1	Potential volume/ha gain (m3/ha/yr)	0.34	0	0.25	0	1.9	0.25	0	0	0.40		
1.2	Years the factor will apply	65	65	65	65	65	65	65	65	65		
1.3	Pot. total merch. volume increment in 65 years (m3)	22,100	0	40,219	0	123,500	32,744	0	0	0		218,563
1.4	Est. yrs reduced to achieve management objectives	5-10	1-3	5-10	0	5-20	5	5-30	0	5-10		
1.4	Est. area that will be reclassified as stocked (ha)			0								0
1.5	Est. area that will be declared as free growing (ha)			0								0
2.0	**Wood Value**											
2.1	Percent improvement in total value at harvest (Compared to no treatment)							5-15%	15-30%	1-5%		
3.0	**Employment**											
3.1	Estimated short term employment (person days/ha)	0.1	0.34	0.1	0.95	2	2.61	3.96	4.54	0.18	0.1	
3.2	Estimated total employment (person days/year)	100	0	248	950	2,000	5,259	0	0	0	749	
3.3	Estimated total full time equivalent positions (FTE)	1	0	1	5	11	29	0	0	0	4	52
4.1	**Forest Health Enhancement (ha)**											0
5.1	**Habitat Supply**											
5.2	Planned area for specific wildlife forage or habitat creation in 2001/2002 (ha)											0
5.3	Est. area with secondary value provided to biodiversity (ha)											0

2.8.3.11 FORT NELSON FOREST REGION

	Performance Measure	Tree Improve-ment	Nursery Seedling Production	Silv. Survey	Site prep.	Backlog Plant	Brush	Space	Prune	Fertilize	Support staff and admin	Totals
	Inputs											
A	**Planned treatment area (ha) in 2001/2002**	924	0	1,899	380	924	1,800	0	0	0	5,927	
1.0	**Timber Supply**											
1.1	Potential volume/ha gain (m3/ha/yr)	0.34	0	0.25	0	1.9	0.25	0	0	0.40		
1.2	Years the factor will apply	65	65	65	65	65	65	65	65	65		
1.3	Pot. total merch. volume increment in 65 years (m3)	20,420	0	30,861	0	114,114	29,250	0	0	0		**194,646**
1.4	Est. yrs reduced to achieve management objectives	5-10	1-3	5-10	0	5-20	5	5-30	0	5-10		
1.4	Est. area that will be reclassified as stocked (ha)			0								**0**
1.5	Est. area that will be declared as free growing (ha)			0								**0**
2.0	**Wood Value**											
2.1	Percent improvement in total value at harvest (Compared to no treatment)							5-15%	15-30%	1-5%		
3.0	**Employment**											
3.1	Estimated short term employment (person days/ha)	0.1	0.34	0.1	0.95	2	2.61	3.96	4.54	0.18	0.1	
3.2	Estimated total employment (person days/year)	92	0	190	361	1,848	4,698	0	0	0	593	
3.3	Estimated total full time equivalent positions (FTE)	1	0	1	2	10	26	0	0	0	3	**43**
4.1	**Forest Health Enhancement (ha)**											**0**
5.1	**Habitat Supply**											
5.2	Planned area for specific wildlife forage or habitat creation in 2001/2002 (ha)											**0**
5.3	Est. area with secondary value provided to biodiversity (ha)											**0**

2.8.4 SUSTAINABLE HARVEST STUDIES TABLES

2.8.4.1 REGIONAL STUDY PRIORITIES

Rank	Project Name	Forest District	Cost 2001/02
1	Operational fertilization Monitoring/Fertilizer Nutrition Study	Prince George	$60 000
2	Forest Health Overview Assessments –	Vanderhoof	$48 000
3	Forest Health Hazard Mapping in Managed Stands	Fort St. James	$35 000
4	Development of Innovative Silvicultural Tactics for Special Use Management Zones	Mackenzie	$40 000
5	Operational Monitoring of Vegetation Management Treatments - NIVMA Program Participation	Dawson Creek	50 000
6	Operational Monitoring of Manual Vegetation Management Treatments - NIVMA Program Participation	Prince George	$30 000
7	Fertilization and Precommercial Thinning in Fire Origin Pine	Fort St. James	$36 120
8	Sulphur Fertilization of Lodgepole Pine –	Vanderhoof	$35 000
9	Efficacy of Herbicide Applications for Operational Brushing - NIVMA Program Participation	Prince George	$30 000
10	Operational Monitoring of broadleaf/conifer interactions for managed stand decision support	Prince George	$50 000
11	Mammal Species in Young Lodgepole Pine Stands –	Vanderhoof	$15 000
12	Monitoring of Silvicultural Intervention impact on Fur-Bearer Populations and their Habitat	Prince George	$10 000
13	Mechanical Site Preparation Study	Vanderhoof	$52 000
14	Efficacy of Backlog NSR Site Preparation and Fill-Planting Tactics	Prince George	$10 000
15	The Potential of Organic (Sewage) Biosolids Waste Disposal on Growth of Juvenile and Pole Stand Forest Crops	Prince George	$10 000
		Total	**$511 120**

2.8.4.2 PRINCE GEORGE FOREST DISTRICT[16]

STUDY 1: OPERATIONAL FERTILIZATION MONITORING/FERTILIZER NUTRITION STUDY

FRBC Cost 2001/02

$60 000

FRBC Total Cost

$100 000 over 5 years.

Funding required for next 3 years

$75 000

Project Total Cost

This project will run for 15 years, with remeasurements every 3 years. Total cost $150 000

Partners Involved

Prince George Forest District, in partnership with Paul Sanborn (MoF - PG Region), Rob Brockley (MoF – Research Branc, Dunkley Lumber Ltd. and Canadian Forest Products Ltd.

Description

Our current knowledge of tree nutrition and fertilization response in the central interior rests on a very narrow base. Most temperate zone forests respond in varying degrees to added nitrogen, and forests of our region are no exception, as demonstrated by the existing trials involving mostly lodgepole pine. This information must be applied in pilot scale operational applications designed to test and expand the base of understanding. This study is supported by strong indications that stand fertilization in the Prince George TSA offers significant short, medium and longterm strategic benefits to resource supply. The results of this study will be fully portable to most of the TSA's within the Region.

Deliverables

This project will be implemented in tandem with future operational fertilization investments in the District, and provide an effective adapaptive management function for evaluating and modifying operational forest fertilization in the Region. Elements of this study compliment the proposals from the Vanderhoof Forest District (role of fertilzer Sulpur) by providing a replication in space as a basis for extrapolation throughout the TSA. Extension publications will be aimed towards local users.

STUDY 2: OPERATIONAL MONITORING OF MANUAL VEGETATION MANAGEMENT TREATMENTS (NIVMA PROGRAM PARTICIPATION)

FRBC Cost 2001/02

$30 000

FRBC Total Cost

$60 000

Funding required for next 3 years

$60 000

Project Total Cost

$100 000 over 5 years

Partners Involved

Ministry of Forests, Prince George Forest, Susan Hoyles, MoF, Prince George Region, in partnership with Canadian Forestry Products Ltd.

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[16] Studies are listed in order of importance within the Forest District

Description

In TSR1 the Chief Forester indicated that vegetation management issues could ultimately affect the mid-and long-term coniferous timber supply. Installation of NIVMA plots (3 installations in four major biogeoclimatic subzones) will be used to monitor various operational treatment regimes, aiding in future yield projections and timber supply determinations.

Deliverables

Locally useful silvicultural treatment resonse data suitable for predicting yield responses associated with manual vegetation management tactics within the Prince George Forest District. This data will also be fully portable to all supply blocks of the TSA.

STUDY 3: OPERATIONAL MONITORING OF BROADLEAF/CONIFER INTERACTIONS FOR MANAGED STAND DECISION SUPPORT

FRBC Cost 2001/02

$50 000

FRBC Total Cost

$150 000

Funding required for next 3 years

$150 000

Project Total Cost

$200 000 over 5 years

Partners Involved

Ministry of Forests, Prince George Forest, Susan Hoyles, MoF, Prince George Region, in partnership with Canadian Forestry Products Ltd.

Description

The operational significance of current free growing guidelines is not well understood. This project is aimed at exploring current policies and practices for prescribing silvicultural treatments to managed stands containing initimate mixtures of various broadleaf species. The project will provide an adaptive management function for evaluating and refining treatment practices to ensure that conifer production may be maintained at the least operational investment cost. The nature of this study is consistent with a high priority knowledge strategy recently identified in the Research Knowledge Gap review. The knowledge gained by this project directly supports the highest priority silvicultural strategies of all TSR;s in the Region.

Deliverables

Locally useful silvicultural treatment data suitable for predicting conifer yield responses and supporting operational prescription decision-making within the Prince George Forest District. This data will also be fully portable to all supply blocks of the TSA.

STUDY 4: EFFICACY OF HERBICIDE APPLICATIONS FOR OPERATIONAL BRUSHING (NIVMA PROGRAM PARTICIPATION)

FRBC Cost 2001/02

$30 000

FRBC Total Cost

$60 000

Funding required for next 3 years

$60 000

Project Total Cost

$100 000 over 5 years

Partners Involved

Ministry of Forests, Prince George Forest, Susan Hoyles, MoF, Prince George Region, in partnership with Canadian Forestry Products Ltd.

Description

In TSR1 the Chief Forester indicated that vegetation management issues could ultimately affect the mid-and long-term coniferous timber supply. Installation of NIVMA plots (3 per year) will be used to monitor various operational treatment regimes using RELEASE ad VISION forest herbicides.

Deliverables

Locally useful silvicultural treatment resonse data suitable for predicting yield responses associated with chemical vegetation management tactics within the Prince George Forest District. This data will also be fully portable to all supply blocks of the TSA.

STUDY 5: MONITORING OF SILVICULTURAL INTERVENTION IMPACT ON FUR-BEARER POPULATIONS AND THEIR HABITAT.

FRBC Cost 2001/02

$10 000

FRBC Total Cost

$30 000

Funding required for next 3 years

$30 000

Project Total Cost

$30 000 over 5 years

Partners Involved

Ministry of Forests, Prince George Forest, in partnership with local fur trapper representatives.

Description

The local impact of conventional silvicultural stand tending tactics on fur bearing mammal populations is not well understood. Forest Renewal Sustainable Harvest objectives emphasize the importance of biodiversity factors as indicators of resource sustainability. This project has local importance to this resource user-group.

Deliverables

Locally useful habitat impact information suitable for silvicultural operational planning. This data will also be fully portable to all supply blocks of the TSA.

STUDY 6: EFFICACY OF BACKLOG NSR SITE PREPARATION AND FILL-PLANTING TACTICS

FRBC Cost 2001/02

$10 000

FRBC Total Cost

$20 000

Funding required for next 3 years

$20 000

Project Total Cost

$40 000 over 5 years

Partners Involved

Ministry of Forests, Prince George Forest, Susan Hoyles, MoF, Prince George Region, in partnership with Canadian Forestry Products Ltd.

Description

Backlog NSR reforestation is a high priority silicultural strategy in all supply blocks of the Prince George TSA. This project will provide an adaptive management function for evaluating and refining various reforestation tactics associated with the backlog investment program. This will ensure the most cost-effective and biologically suited restocking investments are implemented.

Deliverables

Locally useful silvicultural treatment resonse data suitable for predicting yield responses associated with site preparation and stocking enhancement tactics within the Prince George Forest District. This data will also be fully portable to all supply blocks of the TSA.

STUDY 7: THE POTENTIAL OF ORGANIC (SEWAGE) BIOSOLIDS WASTE DISPOSAL ON GROWTH OF JUVENILE AND POLE STAND FOREST CROPS

FRBC Cost 2001/02

$10 000

FRBC Total Cost

$10 000

Funding required for next 3 years

$20 000

Project Total Cost

$20 000 over 5 years

Partners Involved

Ministry of Forests, Prince George Forest, Paul Sanborn, MoF Prince George Region, in partnership with Canadian Forestry Products Ltd. and the City of Prince George

Description

This study is a continuation of a biosolids disposal project initiated in 1998. There may be locally significant potential yield gains associated with this practice. This study establishes a direct link between the Prince George community and forest management practices in the TSA.

Deliverables

Potential yield improvement tactics and community waste disposal strategy.

2.8.4.3 VANDERHOOF FOREST DISTRICT[17]

STUDY 1: FOREST HEALTH OVERVIEW ASSESSMENT

FRBC Cost 2001/02

$48 000

FRBC Total Cost

$200 000

Funding required for next 3 years

$150 000

Project Total Cost

$200 000

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[17] Studies are listed in order of importance in the Forest District

Partners Involved

West Fraser Mills Ltd, Canadian Forest Products Ltd., Plateau Forest Products Ltd., L&M Lumber Ltd. and Ministry of Forests

Description

Pine stem rusts pose a significant risk to second growth lodgepole pine stands throughout the district. The purpose of this study is to identify high risk stands by elevation, aspect and biogeoclimatic site series. Identification of high risk stands will enable silviculturists to plan appropriate silviculture regimes for these areas. A pilot study has been conducted under the supervision of Richard Reich, Regional Pathologist, Ministry of Forests in the western portion of the district for the past two years. The District Silviculture Committee recommends that the study be expanded to cover the entire district, as funding allows. Expected duration of the study is 3 to 4 years. This project has direct linkage to the strategic and tactical priorities determined for the Prince George TSA, and the methodology and many of the interpretations will be fully transferable to the Mackenzie and Robson Valley TSA.

Deliverables

Map of high, moderate and low risk areas for hard pine stem rusts in the Vanderhoof Forest District.

Interim and final reports.

STUDY 2: SULPHUR FERTILIZATION OF LODGEPOLE PINE

FRBC Cost 2001/02

$35 000

FRBC Total Cost

$75 000 over 5 years.

Funding required for next 3 years

$50 000 per year.

Project Total Cost

This project will run for 20 years, with remeasurements every 3 years. Total cost $200 000

Partners Involved

Paul Sanborn (MoF - PG Region), Rob Brockley (MoF – Research Branch – in partnership with the University of Calgary, and West Fraser Mills Ltd, Canadian Forest Products Ltd., Plateau Forest Products Ltd., L&M Lumber Ltd. and Ministry of Forests

Description

Our current knowledge of tree nutrition and fertilization response in the central interior rests on a very narrow base. Most temperate zone forests respond in varying degrees to added nitrogen, and forests of our region are no exception, as demonstrated by the existing trials involving mostly lodgepole pine. However, the really important finding of recent work is that other nutrients, particularly sulphur, and occasionally boron, can also be limiting. Although S deficiency is a general problem across most of the interior, due to geological and environmental factors, only scattered and fragmentary knowledge of minor element status is available. Supplementing N with S has been shown to improve fertilization responses in pine in the SBS, and this finding has already influenced operational treatments. However, much needs to be learned regarding the duration of responses to elements other than N and the most effective forms in which to apply these other elements. This study is supported by strong indications that stand fertilization in the Prince George TSA offers significant strategic benefits to resource supply. The results of this study will be fully portable to most of the TSA's within the Region.

Deliverables

At the completion of initial analyses; establishment report and summary progress report.

Extension publication aimed at general forestry/silviculture audience.

Preparation and submission of journal article; conference presentation(s).

STUDY 3: RESPONSE OF OLD-GROWTH DEPENDENT MAMMAL SPECIES TO VARIABLE STAND DENSITY IN YOUNG LODGEPOLE PINE FOREST

FRBC Cost 2001/02

$15 000

FRBC Total Cost

$45 000

Funding required for next 3 years

$45 000

Project Total Cost

$185 000

Partners Involved

Thomas P. Sullivan, PhD, Director and Research Scientist, Applied Mammal Research Institute in partnership with Sustainable Forest Management Network, University of Alberta, Canadian Forest Products Ltd. - Grand Prairie, and local Vanderhoof stakeholders.

Description

Perhaps the greatest opportunity to diversify forests for the future lies in the vast areas of young second-growth stands, primarily lodgepole pine in the interior, which are amenable to silvicultural practices to accelerate ecosystem development. Pre-commercial thinning is a silvicultural tool that can enhance productivity of crop trees and stand structure. There are indications that some old-growth structural attributes may develop sooner in young stands, particularly at densities < 1000 stems/ha, rather than waiting many decades for these features to appear in unmanaged or high-density stands. Development of such structures may be crucial for some old-growth dependent mammal species. Examples include mule deer, northern flying squirrels, and red-backed voles. This study provides tactical knowledge support to high priority TSA strategies, and will be portable to other management units in the region. As well, it has been strongly endorsed as a high priority knowledge gap area in the recently released FRBC researchable issues report.

Deliverables

Provide scientific data on population dynamics of flying squirrels and red-backed voles and habitat use by deer in these variously treated stands.

By year 15 post-thinning, provide a measure of the capability of these thinned stands to sustain old-growth dependent species.

Input of these results into guidelines for thinning young lodgepole pine stands destined for accelerated development of old-growth features.

STUDY4: BIOLOGICAL EFFECTIVENESS OF MECHANICAL SITE PREPARATION

FRBC Cost 2001/02

$52 000

FRBC Total Cost

$52 000

Funding required for next 3 years

$100 000 ($20 000/year for remeasurement)

Project Total Cost

$230 000

Partners Involved

Brian Walker, Silviculturist, Fraser Lake Sawmills Ltd., Lorne Bedford, Forest Establishment Officer, Ministry of Forests and Ministry of Forests, Vanderhoof.

Description

This study is designed to assess the biological and cost effectiveness of disc trenching on a range of sites. Disc trenching has been used extensively within the Vanderhoof Forest District on a wide range of sites and the results in terms of seedling survival and growth have generally been very satisfactory. However, objective and well-documented comparisons between disc trenching and no site preparation in this area are lacking, and the cost effectiveness of this treatment has yet to be established. This project is designed to fill that gap, by comparing operational disc trenching with no site preparation at locations across a range of site series and associated site and soil properties. Site preparation response information is a key knowledge element in refining silvicultural tactics for both current reforestation and backlog NSR conversion, both of which are high priority tactics within the TSA.

Deliverables

Establishment reports will be submitted after each of the first three field seasons.

Growth and survival data will be analyzed and reported in years three, five and ten.

Progress report, including fifth year plantation performance data.

2.8.4.4 FORT ST. JAMES FOREST DISTRICT[18]

STUDY 1: FOREST HEALTH HAZARD MAPPING IN MANAGED STANDS

FRBC Cost 2001/02

$35 000

FRBC Total Cost

$200 000

Funding required for next 3 years

$55 000

Project Total Cost

$75 000

Partners Involved

Ministry of Forests in partnership with Apollo Forest Products and Canadian Forest Products Ltd.

Description

A strategy to increase timber quantity is to thin and fertilize moderately repressed 40-70 year-old pine stands. The full potential for this treatment is not yet known. Conservative estimates for thinning alone, which is currently being carried out on a limited basis in the Fort St. James District, are that stands will be available for harvest two decades earlier than with no treatment. A thinning program of 200 hectares per year for the next 10 years would provide 2000 hectares for harvest in the mid-term that would not otherwise be available.

Pre commercial thinning is considered for candidate sites close to existing mills which may have a positive benefit on harvest costs. The benefits of this activity would be to the timber supply in the medium and long term and improved timber quality.

Deliverables

Map of high, moderate and low risk areas for the key pests affecting resource supply in the Fort St. James Forest District.

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[18] Studies are listed in order of importance within the Forest District

STUDY 2: FERTILIZATION AND PRECOMMERCIAL THINNING IN FIRE ORIGIN PINE

FRBC Cost 2001/02

$36 120

FRBC Total Cost

$36 120

Funding required for next 3 years

$36 120

Project Total Cost

$75 000 over 15 years

Partners Involved

Canadian Forest Products Ltd.with the Ministry of Forests, Fort St. James District and Paul Sanborn, MoF Region.

Description

A strategy to increase timber quantity is to thin and fertilize moderately repressed 40-70 year-old pine stands. The full potential for this treatment is not yet known. Conservative estimates for thinning alone, which is currently being carried out on a limited basis in the Fort St. James District, are that stands will be available for harvest two decades earlier than with no treatment. A thinning program of 200 hectares per year for the next 10 years would provide 2000 hectares for harvest in the mid-term that would not otherwise be available.

Pre commercial thinning is considered for candidate sites close to existing mills which may have a positive benefit on harvest costs. The benefits of this activity would be to the timber supply in the medium and long term and improved timber quality. If in addition to the standard response there is an effect of helping the stand to overcome density related repression as has been observed in some younger stands, the benefits could be much greater. Potentially, MAI for the remainder of the rotation in these stands might be doubled. This project addresses a forest type and stand structure of most importance to the Fort St. James Supply Block, however the results of this study will be fully portable to similar stands throughout the SubBoreal Spruce biogeoclimatic zone.

Deliverables

Locally specific silicultural tactics for a major component of the silvicultural strategy in the district, and information pertinent to many other management units within and outside the region.

2.8.4.5 MACKENZIE FOREST DISTRICT

STUDY 1: DEVELOPMENT OF INNOVATIVE SILVICULTURAL TACTICS FOR SPECIAL USE MANAGEMENT ZONES

FRBC Cost 2001/02

$40 000

FRBC Total Cost

$120 000

Funding required for next 3 years

$120 000

Project Total Cost

$200 000 over 10 years

Partners Involved

Abitibi Consolidated Ltd. and Slocan Forest Products Ltd. In partnership with the Ministry of Forests.

Description

Local tactical design and innovation is required to address special timber management problems. Most stand interventions are conventional applications of reforestation and stand tending treatments developed for average stand and site conditions. A considerable area of current and pre-'87 stands in the TSA occupy sites with special resource values, or consist of structural characteristics for which conventional silvicultural practices are ineffective, or inefficient. Innovative management tactics are especially needed for the following special situations:

- Riparian management and reserve zones
- Structurally complex stands (multi-layer, multi-species)
- Habitat feature preservation or enhancement
- High recreational value sites
- Special site or timber values

Development of prototype prescriptions, their evaluation and comparison with conventional treatments, and subsequent technology transfer to operations is required. Design of a range of silvicultural tactics will support the high priority strategies identified for the TSA, as well as offering useful knowledge for treating similar forest types and stand structures in other management units.

Deliverables

Locally developed, biologically valid silvicultural tactics designed to implement high priority TSA strategies which address key resource supply issues.

2.8.4.6 DAWSON CREEK FOREST DISTRICT

STUDY 1: OPERATIONAL MONITORING OF VEGETATION MANAGEMENT TREATMENTS (NIVMA PROGRAM PARTICIPATION)

Target Stands:

All pre-free growing stands in the TSA.

Expected Forest Level Benefits:

In TSR1 the Chief Forester indicated that vegetation management issues could ultimately affect the mid-and long-term coniferous timber supply. Installation of NIVMA plots (6 – 8 plots per year) will track success of various operational treatment regimes, aiding in future yield projections and timber supply determinations.

FRBC Cost 2001/02

$50 000

FRBC Total Cost

$150 000

Funding required for next 3 years

$150 000

Project Total Cost

$250 000 over 5 years

Partners Involved

Ministry of Forests, Dawson Creek District and Susan Hoyles, MoF, Prince George Region, in partnership with Canadian Forestry Products Ltd., West Fraser Timber Ltd., Louisiana Pacific Ltd.

Description

In TSR1 the Chief Forester indicated that vegetation management issues could ultimately affect the mid-and long-term coniferous timber supply. Installation of NIVMA plots (6 – 8 plots per year) will track success of various operational treatment regimes, aiding in future yield projections and timber supply determinations. This project is a local initiative fully linked to a high priority SH Research goal recently identified in the Research Knowledge Gap analysis.

Deliverables

Locally useful silvicultural treatment resonse data suitable for predicting yield responses associated with key silvicultural stategies for the TSA. This data will also be fully portable to the Fort St. John TSA.

2.8.5 MANAGEMENT UNIT SUMMARY TABLES

2.8.5.1 PRINCE GEORGE FOREST DISTRICT

Management Unit Summary Table

For the 2001/02 Fiscal Year

	Treatment Area Goals (ha)					**Plan 2001/02**	
	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Enhanced Forestry Program Field Activities	1,950	2,150	2,550	3,050	3,550	256	500,000
Planning, prescriptions and seedlings							75,000
Backlog Program Field Activities	41,400	34,400	23,900	15,700	15,600	121	4,997,500
Planning, prescriptions and seedlings							890,000
Totals	43,350	36,550	26,450	18,750	19,150		6,462,500

Performance Measures

Potential total merchentable volume increment in 65 years	679,884 m^3
Estimated ha that will be reclassified as stocked	5,000 ha
Estimated ha that will be declared as free growing	20,000 ha
Estimated total full time equivalent positions generated	116 FTEs
Forest health enhancement area	0 ha
Planned area for specific wildlife forage or habitat creation	0 ha
Estimated area with secondary value provided to biodiversity	500 ha

2.8.5.2 PRINCE GEORGE WOODLOT ASSOCIATION

Management Unit Summary Table

For the 2001/02 Fiscal Year

	Treatment Area Goals (ha)					**Plan 2001/02**	
	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Enhanced Forestry Program Field Activities	50	50	50	50	50	600	30,000
Planning, prescriptions and seedlings							5,000
Backlog Program Field Activities	1,700	1,500	1,450	1,150	1,150	315	535,000
Planning, prescriptions and seedlings							42,000
Totals	1,750	1,550	1,500	1,200	1,200		612,000

Performance Measures

Potential total merchentable volume increment in 65 years	33,703 m^3
Estimated ha that will be reclassified as stocked	200 ha
Estimated ha that will be declared as free growing	0 ha
Estimated total full time equivalent positions generated	11 FTEs
Forest health enhancement area	0 ha
Planned area for specific wildlife forage or habitat creation	0 ha
Estimated area with secondary value provided to biodiversity	0 ha

2.8.5.3 ROBSON VALLEY FOREST DISTRICT

	Treatment Area Goals (ha)					Plan 2001/02	
	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Enhanced Forestry Program Field Activities	170	150	150	150	150	440	74,800
Planning, prescriptions and seedlings							5,000
Backlog Program Field Activities	3,720	0	0	0	0	93	345,900
Planning, prescriptions and seedlings							31,590
Totals	3,890	150	150	150	150		457,290

Performance Measures	
Potential total merchentable volume increment in 65 years	81,591 m^3
Estimated ha that will be reclassified as stocked	525 ha
Estimated ha that will be declared as free growing	2,800 ha
Estimated total full time equivalent positions generated	11 FTEs
Forest health enhancement area	0 ha
Planned area for specific wildlife forage or habitat creation	0 ha
Estimated area with secondary value provided to biodiversity	0 ha

2.8.5.4 VANDERHOOF FOREST DISTRICT

	Treatment Area Goals (ha)					Plan 2001/02	
	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Enhanced Forestry Program Field Activities	2,088	3,368	3,493	2,184	1,737	322	672,100
Planning, prescriptions and seedlings							98,000
Backlog Program Field Activities	13,979	0	0	0	0	84	1,177,881
Planning, prescriptions and seedlings							52,000
Totals	16,067	3,368	3,493	2,184	1,737		1,999,981

Performance Measures

Potential total merchentable volume increment in 65 years	126,671 m^3
Estimated ha that will be reclassified as stocked	1,875 ha
Estimated ha that will be declared as free growing	7,500 ha
Estimated total full time equivalent positions generated	37 FTEs
Forest health enhancement area	0 ha
Planned area for specific wildlife forage or habitat creation	0 ha
Estimated area with secondary value provided to biodiversity	0 ha

2.8.5.5 FORT ST. JAMES FOREST DISTRICT

	Treatment Area Goals (ha)					Plan 2001/02	
	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Enhanced Forestry Program Field Activities	965	550	593	563	550	437	421,500
Planning, prescriptions and seedlings							171,120
Backlog Program Field Activities	15,446	0	0	0	0	200	3,343,100
Planning, prescriptions and seedlings							388,000
Totals	16,411	550	593	563	550		4,323,720

Performance Measures

Potential total merchentable volume increment in 65 years	204,358 m^3
Estimated ha that will be reclassified as stocked	1,244 ha
Estimated ha that will be declared as free growing	2,000 ha
Estimated total full time equivalent positions generated	82 FTEs
Forest health enhancement area	100 ha
Planned area for specific wildlife forage or habitat creation	0 ha
Estimated area with secondary value provided to biodiversity	0 ha

2.8.5.6 MACKENZIE FOREST DISTRICT

	Treatment Area Goals (ha)					Plan 2001/02	
	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Enhanced Forestry Program Field Activities	3,200	100	100	100	100	47	152,000
Planning, prescriptions and seedlings							0
Backlog Program Field Activities	9,250	0	0	0	0	257	2,380,000
Planning, prescriptions and seedlings							66,000
Totals	12,450	100	100	100	100		2,598,000

Performance Measures

Potential total merchentable volume increment in 65 years	97,590 m^3
Estimated ha that will be reclassified as stocked	150 ha
Estimated ha that will be declared as free growing	3,000 ha
Estimated total full time equivalent positions generated	45 FTEs
Forest health enhancement area	0 ha
Planned area for specific wildlife forage or habitat creation	100 ha
Estimated area with secondary value provided to biodiversity	0 ha

2.8.5.7 MACKENZIE WOODLOT ASSOCIATION

	Treatment Area Goals (ha)					Plan 2001/02	
	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Enhanced Forestry Program Field Activities	0	30	0	0	0	0	0
Planning, prescriptions and seedlings	3,000	3,000	3,000	3,000	3,000		3,660
Backlog Program Field Activities	323	0	0	0	0	517	167,027
Planning, prescriptions and seedlings							0
Totals	3,323	3,030	3,000	3,000	3,000		170,687

Performance Measures

Potential total merchentable volume increment in 65 years	10,167 m^3
Estimated ha that will be reclassified as stocked	0 ha
Estimated ha that will be declared as free growing	0 ha
Estimated total full time equivalent positions generated	2 FTEs
Forest health enhancement area	0 ha
Planned area for specific wildlife forage or habitat creation	0 ha
Estimated area with secondary value provided to biodiversity	0 ha

2.8.5.8 DAWSON CREEK FOREST DISTRICT

	Treatment Area Goals (ha)					Plan 2001/02	
	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Enhanced Forestry Program Field Activities	0	0	0	0	0	0	0
Planning, prescriptions and seedlings							0
Backlog Program Field Activities	23,925	23,798	14,987	16,893	10,184	154	3,682,100
Planning, prescriptions and seedlings	51,592	50,850	50,894	51,031	50,515		51,592
Totals	23,925	23,798	14,987	16,893	10,184		3,733,692

Performance Measures

Potential total merchentable volume increment in 65 years	385,547 m^3
Estimated ha that will be reclassified as stocked	0 ha
Estimated ha that will be declared as free growing	0 ha
Estimated total full time equivalent positions generated	84 FTEs
Forest health enhancement area	0 ha
Planned area for specific wildlife forage or habitat creation	0 ha
Estimated area with secondary value provided to biodiversity	0 ha

2.8.5.9 FORT ST. JOHN FOREST DISTRICT

	Treatment Area Goals (ha)					Plan 2001/02	
	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Enhanced Forestry Program Field Activities	0	0	0	0	0	0	0
Planning, prescriptions and seedlings							0
Backlog Program Field Activities	11,515	11,515	11,515	11,515	11,515	191	2,205,000
Planning, prescriptions and seedlings	100,000	100,000	100,000	100,000	100,000		100,000
Totals	11,515	11,515	11,515	11,515	11,515		2,305,000

Performance Measures

Potential total merchentable volume increment in 65 years	218,563 m^3
Estimated ha that will be reclassified as stocked	0 ha
Estimated ha that will be declared as free growing	0 ha
Estimated total full time equivalent positions generated	52 FTEs
Forest health enhancement area	0 ha
Planned area for specific wildlife forage or habitat creation	0 ha
Estimated area with secondary value provided to biodiversity	0 ha

2.8.5.10 FORT NELSON FOREST DISTRICT

	Treatment Area Goals (ha)					Plan 2001/02	
	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($/ha)	Funding ($)
Enhanced Forestry Program Field Activities	0	0	0	0	0	0	0
Planning, prescriptions and seedlings							0
Backlog Program Field Activities	8,859	6,643	6,963	6,012	6,482	231	2,050,360
Planning, prescriptions and seedlings							542,800
Totals	8,859	6,643	6,963	6,012	6,482		2,593,160

Performance Measures

Potential total merchentable volume increment in 65 years	194,646 m^3
Estimated ha that will be reclassified as stocked	0 ha
Estimated ha that will be declared as free growing	0 ha
Estimated total full time equivalent positions generated	43 FTEs
Forest health enhancement area	0 ha
Planned area for specific wildlife forage or habitat creation	0 ha
Estimated area with secondary value provided to biodiversity	0 ha

3 CURRENT REFORESTATION

3.1 REGIONAL CURRENT REFORESTATION ISSUES AND PRIORITIES

The Current Reforestation Program is driven by Government policy regarding reforestation of stands destroyed by fire and pest damage (Section 22(5) *Forest Practices Code Act*). Apart from this corporate direction, there are no prevailing regional priorities which drive the program. All issues and priorities originate within management units (Forest Districts). Except for existing inventories of non-reforested sites, the unpredictive nature of natural events leading to current reforestation obligations prevents accurate projection in a five year business plan.

3.2 MANAGEMENT UNIT PLANS

Mangement goals and objectives for the Current Reforestation program are defined in government policy. The management unit issues and resource values-at-risk, which are affected by current reforestation performance are similar in nature to those previously discussed for the Sustainable Harvest element (Section 2).

Planned activities, which reflect prevailing local management strategies and tactics are provided in the following subsections.

3.2.1 PRINCE GEORGE FOREST DISTRICT

Table 3.2.1 Current Reforestation Planning Table

		Five-year Plan Goals (ha)					Annual Plan 2001/02		
	Activities	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($)	Funding ($000)	Priority C, H, M, L
1	Planning/surveys/prescriptions	200	66	0	0	500	$25	5.0	M
2	Site preparation	0	0	0	0	0	0	0	
3	Planting	66	0	0	0	0	$450	29.7	H
4	Brushing	0	0	0	0	0	0	0	
5	Max. density spacing	0	0	0	0	0	0	0	
6	Studies	0	0	0	0	0	0	0	
7	Other	0	0	0	0	0	0	0	
	Totals hectares	266	66	0	0	500	$130	34.7	
	Seedling purchase	0	0	0	0	0	0	0	
	Total funding							34.7	

3.2.2 ROBSON VALLEY DISTRICT

Table 3.2.2 Current Reforestation Planning Table

	Five-year Plan Goals (ha)					Annual Plan 2001/02		
Activities	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($)	Funding ($000)	Priority C, H, M, L
1 Planning/surveys/prescriptions	100	400	200	100	600	$43	4.3	H
2 Site preparation	50	0	0	0	0	1,000	50.0	H
3 Planting	50	0	0	0	0	800	40.0	H
4 Brushing	0	0	0	0	0	0	0	
5 Max. density spacing	0	0	0	0	0	0	0	
6 Studies	50	0	0	0	0	40	50.0	M
7 Other	50	50	50	50	50	60	3.0	H
Totals hectares	300	450	250	150	650	331	99.3	
Seedling purchase	50	0	0	0	0	$500		
Total funding							99.3	

3.2.3 VANDERHOOF FOREST DISTRICT

There are no current reforestation requirements within the Vanderhoof Forest District. Areas disturbed by fire have either been determined to be too small, too remote or inaccessible to treat or have been salvage harvested under a prescription. A reverted woodlot licence has achieved a free growing status and areas are now being managed under stand management prescriptions.

Table 3.2.3 Current Reforestation Planning Table

	Five-year Plan Goals (ha)					Annual Plan 2001/02		
Activities	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($)	Funding ($000)	Priority C, H, M, L
1 Planning/surveys/prescriptions	0	0	0	0	0	$0	0	
2 Site preparation	0	0	0	0	0	0	0	
3 Planting	0	0	0	0	0	0	0	
4 Brushing	0	0	0	0	0	0	0	
5 Max. density spacing	0	0	0	0	0	0	0	
6 Studies	0	0	0	0	0	0	0	
7 Other	0	0	0	0	0	0	0	
Totals hectares	0	0	0	0	0	0	0	
Seedling purchase	0	0	0	0	0	0	0	
Total funding							0	

3.2.4 FORT ST. JAMES FOREST DISTICT

There are no current reforestation requirements within the Fort St James Forest District.

Table 3.2.4 Current Reforestation Planning Table

		Five-year Plan Goals (ha)					Annual Plan 2001/02		
	Activities	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($)	Funding ($000)	Priority C, H, M, L
1	Planning/surveys/prescriptions	0	0	0	0	0	$0	0	
2	Site preparation	0	0	0	0	0	0	0	
3	Planting	0	0	0	0	0	0	0	
4	Brushing	0	0	0	0	0	0	0	
5	Max. density spacing	0	0	0	0	0	0	0	
6	Studies	0	0	0	0	0	0	0	
7	Other	0	0	0	0	0	0	0	
	Totals hectares	0	0	0	0	0	0	0	
	Seedling purchase	0	0	0	0	0	0	0	
	Total funding							0	

3.2.5 MACKENZIE FOREST DISTRICT

Table 3.2.5 Current Reforestation Planning Tables

		Five-year Plan Goals (ha)					Annual Plan 2001/02		
	Activities	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($)	Funding ($000)	Priority C, H, M, L
1	Planning/surveys/prescriptions	5152	5000	5000	5000	5000	$0	50.0	H
2	Site preparation	0	0	0	0	0	0	0	
3	Planting	0	0	0	0	0	0	0	
4	Brushing	0	0	0	0	0	0	0	
5	Max. density spacing	0	0	0	0	0	0	0	
6	Studies	0	0	0	0	0	0	0	
7	Other	0	0	0	0	0	0	0	
	Totals hectares	5152	5000	5000	5000	5000	0	50.0	
	Seedling purchase	0	0	0	0	0	0	0	
	Total funding							50.0	

3.2.6 DAWSON CREEK FOREST DISTRICT

Table 3.2.6 Current Reforestation Planning Tables

		Five-year Plan Goals (ha)					Annual Plan 2001/02		
	Activities	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($)	Funding ($000)	Priority C, H, M, L
1	Planning/surveys/prescriptions *	363	363	439	2904	824	$30	10.9	H
2	Site preparation	82	82	0	218	0	$500	41.0	H
3	Planting	177	177	561	311	218	$500	88.5	H
4	Brushing	391	391	406	14	0	$600	235.0	H
5	Max. density spacing	0	0	0	0	0	0	0	M
6	Studies **	0	0	0	0	0	0	0	M
7	Other Airphoto's	0	0	0	0	0	0	0	M
	Totals hectares	1,013	1,013	1,406	3,447	1,042	$370	375.4	
	Seedling purchases	0						0	
	Total funding							375.4	

3.2.7 FORT ST. JOHN FOREST DISTRICT

Table 3.2.7 Current Reforestation Planning Tables

		Five-year Plan Goals (ha)					Annual Plan 2001/02		
	Activities	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($)	Funding ($000)	Priority C, H, M, L
1	Planning/surveys/prescriptions	450	450	450	450	450		16.0	M
2	Site preparation	300	0	500	0	0		210.0	M
3	Planting	620	0	0	0	0		210.0	H
4	Brushing	600	0	0	0	0		240.0	C
5	Max. density spacing	0	0	0	0	500		0	
6	Studies	0	0	0	0	0		0	
7	Other	0	0	0	0	0		0	
	Totals hectares	1970	450	950	450	950			
	Seedling purchase	0	0	0	0	0	0	0	
	Total funding							676.0	

3.2.8 FORT NELSON FOREST DISTRICT

Table 3.2.8 Current Reforestation Planning Table

		Five-year Plan Goals (ha)					Annual Plan 2001/02		
	Activities	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($)	Funding ($000)	Priority C, H, M, L
1	Planning/surveys/prescriptions	300	300	250	250	250	$60	18.0	H
2	Site preparation	60	150	200	200	200	$700	42.0	M
3	Planting	200	180	200	250	250	$800	160.0	H
4	Brushing	100	350	350	200	200	$1500	150.0	M
5	Max. density spacing	0	0	0	0	0	0	0	
6	Studies	0	0	0	0	0	0	0	
7	Other	0	0	0	0	0	0	0	
	Totals hectares	660	980	1000	900	900		370.0	
	Seedling purchase (in ha required)	200	180	200	250	250	$800	160.0	
	Total funding							530.0	

4 FOREST HEALTH MAINTENANCE

4.1 REGIONAL FOREST HEALTH MAINTENANCE ISSUES AND PRIORITIES

The issues reflected in this section are considered forest health priorities in the Prince George Forest Region. However, the strategic and tactical priorities for each management unit (or each forest district (Section 4.2) provide greater detail, scope and more meaningful context to the Forest Health Resource Management Plan. Forest health is a function of local forest properties (stand composition, structure, age and distribribution in the forest. Management strategies and tactics must therefor be based on local analyses of condition and opportunity. There is no prevailing regional forest health strategy, therefor; rather, it reflects the aggregate of all management unit strategies.

Forest health dynamics are the most rapidly changing of all natural forest processes. It is difficult, if not impossible to project forest health planning requirements in a five-year business planning process. For this reason, plan projections beyond one year must be viewed as extremely uncertain. It is also problematic that forest health planning does not share the same business planning cycle as other RMP elements. This should be addressed in future RMP protocols.

4.1.1.1 KEY REGIONAL FOREST HEALTH ISSUES

Mountain Pine Beetle Infestation Level

The forests in the Prince George Forest Region are experiencing a rapidly expanding mountain pine beetle infestation. At least three factors are known to have contribute to epidemic level outbreaks:

- Extensive tracts of mature lodgepole pine stands throughout SubBoreal TSA's;
- Several years of mild winters;
- The impact on forest structure of thirty years of fire suppression policies, which have exacerbated the natural pattern of susceptable lodgepole pine stands.

While the northern Tweedsmuir Park and Entiako areas are currently the focus of media interests, similar accerating infestation levels are common throughout the Prince George, Robson Valley, Vanderhoof, Fort St. James and Mackenzie Forest Districts.

BC Parks Strategic Policies

BC Parks Conservation Program policies consider the current epidemic infestion problem as a natural, forest structure changing, ecosystem process. Ecosystems within Protected Areas, therefore, will be managed to maintain ecological processes in as natural a state as possible. BC Parks' primary responsibility in insect and disease management is to maintain natural ecosystems within parks and ecological reserves.

The following Parks policies direct infestation management strategy within Protected Areas:

- Insect and disease outbreaks will be assessed relative to their impact on the ecosystem within the boundaries of the protected area, and on the broader scosystem values of which the protected area is a part.
- Control measures will be undertaken only if forest and/or vegetation loss is expected to be severe and detrimental to the ecosystem, or if the value of affected features is exceptionally high within, or adjacent to, the protected area.

For many recent Protected Areas, however, BC Parks responsibilities have been expanded to include management or prevention of endemic beetle population expansion within protected areas and adjacent zones. Wherever possible BC Parks are attempting to balance these responibilities with strategic policy in order to address both ecological processes within and commercial interests outside protected area boundaries.

4.1.1.2 REGIONAL FOREST HEALTH MANAGEMENT PRIORITIES

Vanderhoof Forest District

The latest aerial survey results indicate that MPB spot infestations have increased by 300% in the Vanderhoof Forest District to approximately 30 000 spots. Also, large increases in spruce beetle infestations have been observed to cover two thirds of the drainages in the district. The Ministry of Forests have also made commitments to the Village of Fraser Lake to to treat DFB infestations. Control measures are also focussed in the Finger/Tatuk, Francois Lake Park and Stuart River areas.

Fort St. James Forest District

Aerial survey results indicate a higher proportion of attack within strategic areas than originally expected. Strategic priorities now include control of infestations within 40 km radius of the community of Fort St. James, which affects the Murray Ridge ski hill, the Community Forest, private land and numerous woodlots. Control measures are also focussed on the Nation Lake and Mount Pope areas.

Prince George Forest District

An increase in spot infestations of mountain pine beetle has been observed within the district. Areas around the City of Prince George have been declared critical in a stategic plan. The historical "Alexander Mackenzie Trail" is also a management priority, due to the First Nations significance of the feature. Control measures are also focussed on the Carp Lake and Purden Lake Provincial Parks, West Lake, Dahl Lake and Three Sisters Mountain areas.

Robson Valley Forest District

Recent aerial surveys indicate a 30% increase in small infestations above highways 5 & 16, the viewscapes of which are important to the recreational values of the area. Control measures are also focussed in the Mount Robson Park and Swiftcurrent recreational areas.

Mackenzie Forest District

Forest Health priorities in the Mackenzie Forest District focus on epidemic spruce budworm defoliation problems in the northwest, and MPB detection and control measures throughout the district.

4.2 MANAGEMENT UNIT ISSUES AND PRIORITIES

4.2.1 PRINCE GEORGE FOREST DISTRICT

The Forest Health Maintenance Resource Management Plan has two components: the Protection of Current Inventory Sub-program, and the Forest Health Information Sub-program. Table 4.2.1.1 presents the budget estimates for both sub-programs.

Table 4.2.1.1 Forest Health Maintenance Budgeting and Allocation Worksheet

Sub-Program	Sub-Program Component	Required April 1, 2000 ($)	Total for 2000/01 ($)
Protection of Current Inventory Sub-program			
	MoELP Bark Beetle	282 000	333 500
	MoF Bark Beetle	50 000	207 600
Forest Health Information Sub-program	General	142 650	271 250
	Total	**$474 650**	**$812 350**

4.2.1.1 PROTECTION OF CURRENT INVENTORY SUB-PROGRAM - MOUNTAIN PINE BEETLE

Management Objectives

The Prince George Forest District has three management objectives:

- To reduce the spread and impact of the Mountain Pine Beetle within the Prince George Forest District to an endemic level that is manageable.
- To minimise unsalvaged losses as a result of the current epidemic of the IBM.
- ToManage landscapes in a manner which reduce both current and future stand susceptibility to beetle attack.

Management Strategies

The approved Prince George LRMP provides direction when developing beetle management plans. In addition landscape unit planning is currently underway in the Prince George Forest District.. Until that planning process is completed, the low biodiversity emphasis option will be employed when plans are developed to deal with beetle infestations.

The Cariboo-Chilcotin Land-Use Plan, a higher level plan, overlays the south-western portion of our district. It influences how we manage mountain pine beetle and Douglas fir bark beetle in this area. The Alexander Mackenzie Heritage Trail Management Plan must also be given due consideration.

Prevention Strategies are encouraged when infestation levels have been significantly reduced and after initial entry has taken place. The long term prevention opportunity is to stratify our forests by removing susceptible host in an organised manner.

The Prince George Forest District staff have worked together with licensees, Regional staff, and UNBC experts to develop a "Bark Beetle Best Practice Guideline" that will assist Foresters in developing plans that are consistent.

Resource Values at Risk

The values that are threatened in the Prince George Forest District are complex and intertwined. Woodlots, agricultural lease land, deeded land, private timber lands, parks, protected areas, visual corridors, and historic trails all add to this complexity. Beetle management strategies must be employed consistently while recognising the values at risk and and the management constraints imposed by the various forms of land and forest tenure.

Current inventories show the PG District as holding:

Douglas Fir	7 069 000 m^3
Balsam	56 230 000 m^3
Spruce	196 671 000 m^3

Volumes are based on age class 5+ for pine and age class 6+ for all other species.

Specific strategies and tactics to address pest populations in the following Parks and Protected areas follows:

CARP LAKE PROVINCIAL PARK PLANNING $40 000

Aerial bark beetle surveys & mapping ($10 000).

A forest health aerial GPS survey was flown in September 1999. 1:50 000 incidence and susceptability maps were produced.

Walkthroughs ($5 000)

Walkthroughs were completed to further identified beetle attack, amount of blowdown and treatment options.

Forest & Fire Management Plan ($25 000)

Completion of fire history, vegetation, and blowdown mapping. Preliminary assessment and identification of suitable areas for prescribed burning program.

2000/2001 Site Work Required ($215 000)

Site specific Prescribed Burning Plan ($10 000)

Conducting Prescribed Burn – 70 ha - ($200 000)

MSMA ($5 000)

PRINCE GEORGE FOREST DISTRICT ($25,500)

Walkthroughs ($17 000)

Ground surveys were completed on Nechako Ecological Reserve, Dahl Lake, Purden Lake, West Lake and Three Sisters prior to any fall and burn programs being initiated.

Fall and burn – West Lake ($1 100)

26 fall & burn

Fall and burn – Three Sisters ($3 300)

75 fall & burn

Fall and burn – Dahl Lake ($4 100)

95 fall & burn

2000/2001 Site Work Required ($50 000)

Dahl Lake beetle aerial survey & susceptability mapping ($10 000)

Continuation of fall and burn program at Three Sisters, Dahl & West Lake ($40 000)

Bark Beetle Status

The Prince George Forest District has been rated for host susceptibility for the Spruce , Fir and Pine. Susceptibility maps can be viewed on the Ministry of Forests FTP server (ftp.for.gov.bc.ca/Prince_George_Region/Prince_George/external\outgoing\forest_health\hazards.zip).

Current bark beetle status from overview surveys in 1999 can be viewed on the

Plot files for and p300_99.zip can be found on Ministry of Forests FTP server (ftp.for.gov.bc.ca/Prince_George_Region/Prince_George/external\outgoing\forest_health)

Planned Management Activities

Project management activities are listed in Tables 4.2.1.2 and 4.2.1.3.

Table 4.2.1.2 Parks Beetle Funding

Activity	Priority #1	
	Output (units)	Expenditure ($)
Aerial overview survey[19]		10 000
Ground survey	5 parks	22 000
Fall & Burn	196 trees	48 500
MSMA Treatment		5 000
Forest Fire Management Plan		25 000
Prescribed burn	70 ha	210 000
Susceptibility Mapping		10 000
Totals		**$333 500**

Table 4.2.1.3 Forest Service Beetle Funding

Activity	Priority #1	
	Output (units)	Expenditure
Fall & Burn	4 152 trees	207 600
Totals		**$207 600**

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[19] Aerial overview funding within MoF Regional budget

4.2.1.2 FOREST HEALTH INFORMATION SUB-PROGRAM - GENERAL

Management Objectives

The Forest Health General budget will be managed as an operational minimum budget with the exception that we have planned control strategies for historic endemic IBM populations.

Aerial surveys must always be done to document trends and ensure proper priority is placed on each polygon of attack. Baiting plans are used each year as a monitoring tool. This approach not only contains population remnants at treatment areas, but, also serves to record the percent of overflow attack from year to year. A conservative ground survey budget is proposed and used to provide planners with a higher confidence level relating to red to green ratios and used to project direct control funding needs to year end.

Resource Values

Our primary control opportunity is through harvest. Market purchase price will again affect the economical skid distance and volumes needed to mobilize and demobilize. What remains a constant is our Small-Scale Salvage rate that must be adaptive to this fluctuating control

Planned Activities

Planned Forest Health Information Sub-program activities are listed in Table 4.2.1.4

Table 4.2.1.4 Planned Forest Health Information Activities

Proposed Activity (in order of priority)	**Expenditure ($)**
#1 Aerial survey	$58 000
#2 Ground surveys	$35 000
#3 Fall and burn	$95 600
#4 GIS mapping	$40 000
#5 2-yeare cycle budworm	$22 650
#6 Baiting	$20 000
Total	**$271 250**

Table 4.2.1.5 Protection of Current Inventory Sub-Program

Activities	Units	Five-year Plan Goals 2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Annual Plan 2001/02 Unit Cost ($)	Funding ($)	Priority C, H, M, L
1 Ground Surveys	ha	75000	75000	75000	75000	75000	125	9375000	H
3 Aerial Survey - overview	ha	2000000	2000000	2000000	2000000	2000000	0.03	60000	H
4 Aerial Surveys - detailed	ha	1200000	1200000	1200000	1200000	1200000	0.12	144000	H
Totals hectares		3275000	3275000	3275000	3275000	3275000			
5 Aerial Survey - overview	hrs flying time								
6 Aerial Surveys - detailed	hrs flying time								
7 Fall and burn treatment	trees	800	800	800	800	800	59	47200	H
Forest fire plan		70						25000	H
Prescribed burn	ha	70						210000	H
8 MSMA treatment	trees	150	150	150	150	150	30	5000	H
10 Archeological studies	projects	1					35,000	35000	M
Totals		1091	950	950	950	950		$9,901,200	

Table 4.2.1.6 Forest Health Information Subprogram

Activities	Units	Five-year Plan Goals 2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Annual Plan 2001/02 Unit Cost ($)	Funding ($)	Priority C, H, M, L
1 Ground Survey	ha	280	280	280	280	280	125	35000	H
Totals hectares									
2 Aerial Survey - overview*		2000000	2000000	2000000	2000000	2000000	0.03	58000	H
Studies – 2 year budworm		1	1	1	1	1		22700	M
5 · Pheromones	trees	666	666	666	666	666	30	20000	L
Fall and Burn	trees	1648	1648	1648	1648	1648	58	95600	H
7 Other – GIS Mapping								40000	M
Totals								$271,300	

Table 4.2.1.7Performance Indicators for Protecting Current Inventory Sub-program (based on funding at plan level)

Activity	Unit	Anticipated Achievments[20]
Aerial Surveys - Overview	est. % of forested area surveyed/hrs flown/ ha	
Aerial Surveys - Detailed	est. % of susceptible area surveyed/ hrs flown/ ha	
Ground Surveys	est. % of aerially detected infestations gd. surveyed/ ha	
Treatments	est. % of currently detected infestations addressed by:	
Expedited Harvesting	% / Cubic metres	
Deferred and baited	% / Cubic metres / trees baited	
Single Tree treatments:	% / Cubic metres	
Single Tree Removal	*Cubic metres*	
Fall and Burn Treatment	*Trees*	
MSMA Treatment	*Trees*	
Abandoned for salvage	% / Cubic metres	
Unsalvagable	% / Cubic metres	
Defoliator Treatment	Hectares treated	
		estimated percentage to the nearest 20%

Table 4.2.1.8Performance Indicators for Forest Health Information Sub-program (based on funding at plan level)

Activity	Unit	Anticipated Achievments
Aerial Surveys - overview[21]	% of district mapped (ha)	
Ground Surveys	ha	
Studies/ Operational Trials:		
· Hazard and risk	Studies completed/ initiated/maintained	
· Impact analyses (G&Y)	Studies completed/ initiated/maintained	
· Treatments	Studies completed/ initiated/maintained	
Training Courses	Courses (# trained)	

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[20] estimated percentage to the nearest 20%

[21] Reported in this table if District has no Protection of Current Inventory Sub-progam

4.2.2 ROBSON VALLEY FOREST DISTRICT

The Forest Health Maintenance Resource Management Plan has two components: the Protection of Current Inventory Sub-program, and the Forest Health Information Sub-program. Table 4.2.2.1 presents the budget estimates for both sub-programs. The major emphasis in the Robson Valley Forest District is the former, however, consisting of the control of a currently rising endemic scale infestations in the District.

Table 4.2.2.1 Forest Health Maintenance Budgeting and Allocation Worksheet

Sub-Program	**Sub-Program Component**	**Required April 1, 2000 ($)**	**Total for 2000/01 ($)**
Protection of Current Inventory Sub-program			
	MoELP Bark Beetle		5 000
	MoF Bark Beetle	160 500	172 000
Forest Health Information Sub-program	General	58 650	64 650
SBFEB			12 000
	Total		$253 650

4.2.2.1 PROTECTION OF CURRENT INVENTORY SUB-PROGRAM - MOUNTAIN PINE BEETLE

Management Objectives

The mountain pine beetle is the most destructive agent currently affecting forest resources within the Robson Valley's Timber Supply Area. All of the mature pine forests within the TSA are currently at risk from this bark beetle and if it is not aggressively managed, this insect will undoubtedly have a significant impact on the future of Robson Valley timber supply and the economic viability of the local forest industry. Sixteen percent of the District's timber harvesting land base is pine. The most recent outbreak has been active for five years. Populations have increased dramatically since 1998. Based on overview surveys, it is estimated that there are currently in excess of 3,500 hectares of pine forest affected, the majority of which is in the southern half of the District.

The objectives of the Robson Valley TSA Mountain Pine Beetle Management Strategy are to:

- reduce the spread and impact of mountain pine beetle within the TSA;
- minimise unsalvaged losses as a result of epidemic infestations (>7,000 m^3 annually);
- reduce beetle populations to a manageable and endemic levels;
- identify and prioritize highly susceptible stand to access, modify and/or remove timber before significant losses occur;
- conduct hazard and risk assessment to determine stand susceptibility to beetle attack.

Strategies

The Robson Valley TSA has been stratified into the Trench (Highway 16 and 5), Kinbasket Lake and the back drainage's. The stratification was based on current infestation levels, landscape susceptibility and the need for two different strategies across the TSA. These are described below as the Suppression Zone and the Maintain Low/Salvage Zone. A third strategy, Prevention is to be applied across the TSA where appropriate and when available resources allow.

STRATEGY 1: SUPPRESSION ZONE

The Suppression zone has been identified as that portion of the TSA that is predominantly comprised of moderate to high susceptible stands currently under the influence of low to moderate beetle incidence. This area includes the Trench (Highway # 16 and # 5), and Kinbasket Lake. A Suppression Strategy will be applied to these zones. The Suppression Strategy demands that each infested polygon be addressed with a single treatment or treatment combination. Detailed detection and follow-up must be carried out every year to ensure expedient sanitation of infested stands. All possible direct control tactics should be considered and applied where suitable. Where ever possible a harvest tactic should be given first consideration. Long-term approaches to reduce future threats to timber or other resources will also be applied. This strategy must be continued until:

- moderate to high hazard stands are removed;
- the infestation collapses; or
- infestation levels exceed the resources available for a suppression program.

STRATEGY 2: MAINTAIN LOW/SALVAGE ZONE

The Maintain Low/Salvage zone has been identified as the back drainage's of the TSA and that is predominantly comprised of low to moderate susceptible stands currently under the influence of low to moderate beetle incidence. This zone is confined at this time to the Holmes River drainage. The intent of this strategy is to carry out beetle activity in the normal planning process and to deal with newly detected infestations as they arise. It is important that the mountain pine beetle continue to be addressed on a priority basis. Rigorous detection combined with the use of pheromone baiting and harvesting must be carried out. All major access should be in place or planned in conjunction with hazard rating. Single tree treatments will only be utilized in small inoperable areas where infestations are placing adjacent healthy stands or other strategic units at risk. Within this zone areas will be managed under more of a salvage strategy.

STRATEGY 3: PREVENTION STRATEGY

The Prevention Strategy will have limited application across the Robson Valley TSA until infestation levels are significantly reduced from current levels. The intent of this strategy is to reduce susceptibility and future impacts through forest cover manipulation. The overall strategy is to remove susceptible host in an organized manner that will not create continuos stands of susceptible forest over the next rotation.

Resource Values at Risk

The most significant risk from the mountain pine beetle and other bark beetles is the potential impact to the long-term timber supply. The Robson Valley TSA has a current AAC of 602,377 m^3. If the current levels of infestation persist at the current rate without aggressive control measures, the long-term timber supply in this TSA could be severely impacted. The forest health and unsalvaged losses in the Robson Valley TSA are expected to average 92,604 cubic metres per year with the majority of the loss related to hemlock looper, beetles and fire.

The mountain pine beetle also poses risks to Parks, Proposed Protected Areas and private properties in the TSA. Other values at risk, although of lesser impact, include recreation and scenic values.

The total area of susceptible forest in the Robson Valley TSA totals 34,140 ha (includes low, moderate and severe hazard types). The mountain pine beetle has expanded to epidemic proportions in the past 4-5 years. Particularly in 1997 and 1998 expansion were as high as 10:1 green attack to red attack rations.

The total area of susceptible forest in the Robson Valley TSA totals 34,140 ha. The number of green attacks to red attacks in 1999 was much less than in 1998. The average green-to-red ration was 3:1 throughout the Robson Valley TSA. This still relates to large expansions due to the tremendous increase seen in 1998.

The mountain pine beetle was still flying in late September (1999). As a result, the galleries are very short and there is little or no brood from the late flight. But due to the milder than normal winter temperatures it appears that populations had a low overwinter mortality. The winter had little affect on the brood development although the green to red ration is expected to drop. This situation presents an excellent opportunity for aggressive management of the beetle. All management activities can be expected to have a relatively greater impact on beetle populations due to this reduced population. However, population trends can quickly reverse if our weather in 2000 is above normal temperatures.

Table 4.2.2.2 Parks Beetle Funding

Activity	Priority #1		Priority #2	
	Output (units)	Expenditure	Output (units)	Expenditure
Detailed aerial survey			10 mapsheets	$5 000
Totals				**$5 000**

Table 4.2.2.3 Forest Service Beetle Funding

Activity	Priority #1		Priority #2	
	Output (units)	Expenditure	Output (units)	Expenditure
Aerial overview survey	64 mapsheets[22]			
Detailed aerial survey	34 mapsheets	$40 000		
Ground survey	1 000 ha	$50 000		
Photography	Trench Area	$5 500		
Fall & Burn	1000 trees	$60 000		
Pheromones			500 baits	$10 000
Trap trees			100 trees	$2 000
Risk and Hazard mapping	1 project	$5 000		
Totals		**$160 500**		**$120 000**

4.2.2.2 FOREST HEALTH INFORMATION SUB-PROGRAM - GENERAL

Management Objectives

Armilaria Root Disease Study

The purpose of the Armillaria Root Disease Operational Adjustment Factor Study is to measure the frequency of small gaps between a "healthy" landscape stratum and an Armillaria-infested landscape stratum. The area of interest is the East Kinbasket – Ptarmigan Landscape Unit. The goal for the Armillaria operational maps and database is to develop tools that would help in disease management and forest operational decisions within the District.

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[22] Aerial overview funding provide by Prince George Region.

Spruce Budworm Study

The Robson Valley TSA covers a total area of 1,235,227 ha with a timber harvesting land base of 213,383 ha. Sixty three percent of the timber harvesting land base is a Spruce Balsam mix. The two year cycle budworm in combination with the Spruce and Balsam beetle is causing significant damage to the Goat / Milk River, Morkill River, and Dore River drainage's. Defoliation is notably lighter in several other areas.

The two year cycle budworm study workplan calls for:

- GIS overlay of defoliation history and forest cover. Selection of candidate plot locations in the Robson Valley. B. Low, R. Quenet.
- Establish 15 new impact plots in the Robson Valley Forest Districts. R. Alfaro, A. Shand.
- Analyze data, develop stand hazard models and write reports on tree growth and mortality. R. Alfaro, A. Shand.
- Dendro-ecology of the 2 year cycle budworm in the Robson Valley District . R. Alfaro.
- Determination of budworm life cycle and population –defoliation relationships in the Robson Valley Forest District. V. Nealis. In addition to life cycle information a system/formula will be produced for predicting tree mortality based on percent tree defoliation. This system will work with existing operational surveys.

Planned Activities

Table 4.2.2.4 Planned Forest Health Information Activities

Proposed Activity (in order of priority)	**Priority #1**	**Priority #2**
#1 Armillaria Operational Adjustment Factor Study and operational mapping	$38,000	
#2 Budworm Project	$17,650	
#3 Forest Health Surveys	$3,000	$6 000
Total	**$58 650**	**$6 0000**

Forest Health Maintenance Resource Management Plan

The five year budget and activity projections for both Forest Health Maintenance Sub-programs Robson Valley RMP are presented in Table 4.2.2.5 and 6. The performance indicators for the former sub-program are estimated in Table 4.2.2.7.

Table 4.2.2.5 Protecting Current Inventory Sub-Program Plan

			Five-year Plan Goals					Annual Plan 2001/02		
	Activities	Units	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($)	Funding ($)	Priority C, H, M, L
1	Ground Surveys	ha	2 000	1 500	1 500	1 500	1 500	$50	$100 000	C
2	Defoliator spraying	ha	0	0	0	0	0	0	0	
Totals hectares			2 000	1 500	1 500	1 500	1 500			
3	Aerial Surveys	hrs flying time	60	50	50	50	50	800	48 000	C
4	Fall and burn treatment	trees	1 500	1 000	1 000	1 000	1 000	60	90 000	C
5	MSMA treatment	trees	0	0	0	0	0	0	0	
6	Pheromone baiting	trees	1 000	700	700	700	700	25	25 000	C
	Totals		6 560	4 750	4 750	4 750	4 750		$263 000	

Table 4.2.2.6 Forest Health Information Subprogram

		Five-year Plan Goals					Annual Plan 2001/02		
Activities	Units	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($)	Funding ($)	Priority C, H, M, L
Studies - Budworm	studies	1 study	1 study	1 study	1 study	1 study	8 000	8 000	H
Other Armaillaria OFA's	studies	1 study					22 000	22 000	H
Totals		0	0	0	0	0		$30 000	

Table 4.2.2.7 Forest Health Plan Performance Indicators (based on funding at plan level)

Activity	Unit	Expected Achievement
Aerial Surveys - Overview	est. % of forested area surveyed/hrs flown/ ha	80 %
Aerial Surveys - Detailed	est. % of susceptible area surveyed/ hrs flown/ ha	50 %
Ground Surveys	est. % of aerially detected infestations gd. surveyed/ ha	80%
Treatments	est. % of currently detected infestations addressed by:	60%
Expedited Harvesting	% / Cubic metres	45 %
Deferred and baited	% / Cubic metres / trees baited	15 %
Single Tree treatments:	% / Cubic metres	
Single Tree Removal	*Cubic metres*	5 000
Fall and Burn Treatment	*Trees*	1 500
MSMA Treatment	*Trees*	0
Abandoned for salvage	% / Cubic metres	25 %
Unsalvagable	% / Cubic metres	30 %
Defoliator Treatment	Hectares treated	0

Table 4.2.2.8Performance Indicators for Forest Health Information Sub-program (based on funding at plan level)

Activity	Unit	Anticipated Achievments
Studies/ Operational Trials:		
	Studies completed/ initiated/maintained	
	Studies completed/ initiated/maintained	

4.2.3 VANDERHOOF FOREST DISTRICT

The Forest Health Maintenance Resource Management Plan has two components: the Protection of Current Inventory Sub-program, and the Forest Health Information Sub-program. Table 4.2.3.1 presents the budget estimates for both sub-programs. The major emphasis in the Vanderhoof Forest District is the former, however, consisting of the control of epidemic scale infestations in the District.

Table 4.2.3.1 Forest Health Maintenance Budgeting and Allocation Worksheet

Sub-Program	Sub-Program Component	Spent in 1999/2000 ($)	Required April 1, 2000 ($)	Total for 2000/01 ($)
Protection of Current Inventory Sub-program				
	MoELP Bark Beetle	208 654	150 000	429 000
	MoF Bark Beetle	1 150 534	450 000	1 785 000
	SBFEP Forest Health[23]	676 338		200 000[24]
Forest Health Information Sub-program	General	186 632		197 000
	Total	2 222 158	600 000	2 611 000

A minimum of $2.2 million will be required to manage the mountain pine beetle epidemic in the Vanderhoof Forest District.

4.2.3.1 PROTECTION OF CURRENT INVENTORY SUB-PROGRAM - MOUNTAIN PINE BEETLE

Management Objectives

The mountain pine beetle (MPB) is the most destructive agent currently affecting forest resources within the Vanderhoof Forest District. All of the mature pine forests within the forest district are currently at risk to damage from this bark beetle and if it is not aggressively managed, this insect will undoubtedly have a significant impact on the future of Vanderhoof's timber supply, the economic viability of the local forest industry and the socio-economic sustainability of the communities within the Vanderhoof Forest District. The largest outbreak ever recorded occurred in 1998 but only became visible in 1999. The scale of this outbreak is illustrated in Figure 4.2.3.1. In 1999 the level of MPB infestation increased from a 17 year average of 120 hectares to 12,510 hectares and a 5 year average of 435 infestations to 11,315 infestations.

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[23] additional information that shows the total amount spent on managing mountain pine beetle in the Vanderhoof Forest District

[24] requested $400,000, only received $200,000

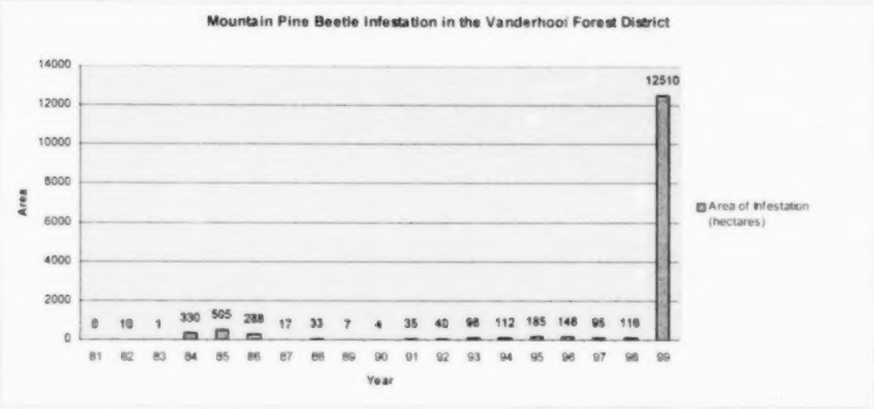

Figure 4.2.3.1 **Recent history of MPB infestations in the Vanderhoof Forest District.**

The objectives of the Vanderhoof Forest District Mountain Pine Beetle Management Strategy are to:

- reduce the spread and impact of mountain pine beetle within the district;
- minimise unsalvaged losses as a result of the epidemic;
- reduce beetle populations to, and maintain them at, manageable, endemic levels. (<500 ha affected annually); and,
- manage landscapes in a manner which reduce both current and future stand susceptibility to beetle attack.

Management Strategies

To facilitate planning and the assignment of landscape level strategies, the Vanderhoof Forest District has been stratified into units. The stratification was based on current infestation levels and landscape susceptibility and illustrates the need for three different bark beetle management strategies across the district. These are described below as the Suppression Zone strategy, Holding Action Zone strategy, and the Monitor Zone strategy. A fourth strategy, Prevention, is to be applied across the district where appropriate and when available resources allow.

STRATEGY 1: SUPPRESSION ZONE

The Suppression zone has been identified as the northern two thirds of the Vanderhoof Forest District, including Parks and Protected Areas, that is predominantly comprised of moderate to high susceptible stands currently experiencing a low to moderate beetle incidence. This area includes SBS and ESSF ecosystems. A Suppression Strategy will be applied to this zone. The Suppression Strategy demands that each infested polygon be addressed with a single treatment or treatment combination. Detailed detection and follow-up must be carried out every year to ensure expedient sanitation of infested stands. All possible direct control tactics should be considered and applied where suitable. Where ever possible a harvest tactic should be given first consideration. Long-term approaches to reduce future threats to timber or other resources will also be applied. This strategy must be continued until:

moderate to high hazard stands are removed; or

the infestation collapses; or

infestation levels exceed the resources available for a suppression program.

It should be noted that a suppression program was successful throughout the entire district for a period of 17 years from 1982 to 1998. In 1999, the infestation levels exceed the resources available for a suppression program in the southern portion of the district.

STRATEGY 2: HOLDING ACTION ZONE

The Holding Action Zone has been identified as the southern one third of the Vanderhoof Forest District that is predominantly comprised of moderate to high susceptible stands currently under the influence of high to severe beetle incidence. . This area includes SBS, SBPS and ESSF ecosystems. This area is confined at this time to the Lucas, Yellow Moose, Earhorn, Chedakuz, Capoose, Van Tine, Fawnie, Kuyakuz, Cow, Laidman, Matthew, Tsacha, Johnny, Moose, Naglico and Malaput drainages. The intent of this strategy is to maintain the existing outbreak at a relatively static level. It is a delaying strategy until adequate resources are available or access created allowing more aggressive management. It is important that the mountain pine beetle continue to be addressed on a priority basis. Rigorous detection combined with aggressive road development and sanitation harvesting must be carried out. All major access should be planned in conjunction with hazard rating. Single tree treatments will only be utilized in small inoperable areas or as a short term holding measure until road access can be constructed. This strategy is to be implemented when sufficient harvesting capacity is available and all other high priority areas have been adequately addressed. Within two or three years it is anticipated that the strategy for the southern third of the district will shift to either a maintain low strategy or a salvage strategy depending on the level of infestation and availability of resources.

STRATEGY 3: MONITOR STRATEGY

The Monitor zone has been confined to the Entiako Park within the Vanderhoof Forest District It is predominantly comprised of moderate to high susceptible stands currently under the influence of high to severe beetle incidence. This area includes SBS, SBPS and ESSF ecosystems. This strategy is applied to areas where the management efforts allowed within parks and provided for by available resources would be ineffective in substantially reducing the beetle population and subsequent levels of damage. The only management under consideration for the Entiako Park is controlled burns with the objectives of host removal, fuel reduction and reducing beetle populations.

STRATEGY 4: PREVENTION STRATEGY

The Prevention Strategy will have limited application across the Vanderhoof Forest District until infestation levels are significantly reduced from current levels. The intent of this strategy is to reduce susceptibility and future impacts through forest cover manipulation. The overall strategy is to remove susceptible host in an organized manner that will not create continuos stands of susceptible forest over the next rotation.

Resource Values at Risk

The Vanderhoof Forest District has 61% of its forested landbase composed of mature pine forest cover types. The most significant risk from the mountain pine beetle and other bark beetles is the potential impact to the long-term timber supply. Approximately 775,000 m3 (3,100 ha) of MPB infested wood was harvested in 1999/2000. This is about 45% of the timber harvested in the district. If the current levels of infestation persist at the current rate without aggressive control measures, the long-term timber supply in this district will be severely impacted.

The current accelerated level of access development could also affect wildlife habitat and migration routes within the district. The mountain pine beetle also poses risks to Parks and Proposed Protected Areas in the district. Other values at risk, although of lesser impact, include recreation, scenic values, public perception and safety.

All Parks and Protected Areas within the Vanderhoof Forest District are currently being impacted or are threatened by the mountain pine beetle. 579 mountain pine beetle infestations totaling 7 997 hectares (63% of the district total) were mapped in 1999 within the following Parks and Protected Areas which are included in this proposal:

- Entiako Park
- Finger-Tatuk Park
- Francois Park
- Stuart River Park
- Upper Sutherland Park
- Nechako Canyon Protected Area

All identified mountain pine beetle infestations within the Parks and Protected Areas were felled and burned in 1999/2000 with exception of the Entiako Park. None of the 410 mountain pine beetle infestations totaling 7,959 hectares within the Entiako Park were treated in 1999/2000.

The Ministry of Forests and BC Parks is working on co-operatively developing strategies for managing bark beetles in Parks and Protected Areas.

Bark Beetle Status

The mountain pine beetle hazard rating using the Shore-Safranyik model is currently being completed by Region. The summary of susceptible forests will not available until later this year.

The mountain pine beetle expanded to epidemic proportions in the southern portion of the Vanderhoof Forest District between 1998 and 1999 (see Figure 1). In 1998 green attack to red attack ratios of 38:1 were recorded in the vicinity of Capoose Creek and 100:1 in the area north of Johnny Lake. The average number of green attacks to red attacks in 1998 (green-to-red ratio) was 9:1. The average green-to-red ration in 1999 was 3:1.

The peak of the mountain pine beetle flight in 1999 occurred between mid-August and mid-September. As a result, the galleries in late fall were very short and with little or no brood. Even in trees attacked earlier, the brood development was minimal. Despite the delayed life cycle, there is a slight chance that populations experienced significant overwinter mortality due to the mild temperatures. This situation presents an excellent opportunity for aggressive management of the beetle. All management activities can be expected to have a relatively greater impact on beetle populations due to this reduced population vigour. However, population trends can quickly reverse if our weather in 2000 is near normal or warmer.

General Approach

The entire bark beetle program in the Vanderhoof Forest District is coordinated among District staff, licensees and SBFEP through Bark Beetle Strategy meetings, Planning Meetings, one-on-one Licensee/ District meetings and Round-table discussions. Discussions on bark beetle strategies and progress can occur as often as daily (e.g. SBFEP) to once a week or quarterly dependent upon the scope of bark beetle problem each individual licensee is responsible for. Major forest licensees are involved in all aspects of the Bark Beetle program including, planning, detailed aerial surveys, single tree treatments and ground reconnaissance. Environment and other stakeholders

(Parks, First Nations, Woodlot licensees, private landowners, Environment) are involved in all aspects of the planning and strategy sessions.

Planned Management Activities

The planned management activities for 2000/2001 are summarized in Tables 4.2.3.2 and 3.

Table 4.2.3.2 Parks Beetle Funding

Activity	Priority #1		Priority #2	
	Output (units)	Expenditure	Output (units)	Expenditure
Aerial overview survey	ha		93 240 ha	Regional Budget
Detailed aerial survey	20 838 ha	$5 000	ha	
Ground survey	500 ha	$62 500	ha	
Photography	72 400 ha	$11 500	ha	
Fall & Burn	2 500 trees	$200 000	# trees	
Prescribed burn			3 000 ha	$150 000
Totals		**$279 000**		**$150 000**

Table 4.2.3.3 Forest Service Beetle Funding

Activity	Priority #1		Priority #2	
	Output (units)	Expenditure	Output (units)	Expenditure
Ground survey	5 000 ha	$625 000	ha	
Fall & Burn	10 000 trees	$750 000	2 000 trees	$150 000
Harvesting (heli-logging)	6 000 trees	$240 000	ha	
Other (Beetle Management Planning)	1 286 160 ha	$20 000		
Totals		**$1 286 160**		**$150 000**

4.2.3.2 FOREST HEALTH INFORMATION SUB-PROGRAM - GENERAL

Management Objectives

By maintaining healthy forests, stumpage revenues are maximized. Reducing unsalvaged losses will sustain and increase harvest levels (preventing short term AAC uplifts and delaying fall downs). It also minimizes or prevents the early harvest of second growth stands before culmination age, in situations where catastrophic forest health events have led to a shortfall in mature volume availability.

Our management objective is to maintain healthy forests in order to sustain the local economy and other resource values such as outdoor recreation.

Resource Values

The forest profile is predominantly mature lodgepole pine types. With the harvest of mature lodgepole pine types, a shift in the age profile is occurring and more young stands are being created. Young pine face a multitude of pests that could impact on its development. However, due to the higher priority of managing the current mountain pine beetle epidemic, general forest health funds are proposed for detecting and treating bark beetle infestations rather than managing pests in immature stands.

Planned Activities

Planned Forest Health Information Activities for 2000/2001are summarized in Table 4.2.3.4.

Table 4.2.3.4 Planned Forest Health Information Activities

Proposed Activity (in order of priority)	**Expenditure ($)**
#1 Detailed aerial survey (250 000 ha)	$50 000
#2 Photography (450 000 ha)	$72 000
#3 Fall and burn (1 000 trees)	$75 000
#4 Aerial overview survey (1 286 760 ha)	Regional Budget
Total	**$197 000**

Forest Health Maintenance Resource Management Plan

The five year budget and activity projections for both sub-programs of the Vanderhoof Forest Health RMP are presented in Tables 4.2.3.5.and 6. T he performance indicators for the former sub-program are estimated in Table 4.2.2.7.

Table 4.2.3.5 Protection of Current Inventory Sub-Program

		Five-year Plan Goals					**Annual Plan 2001/02**		
Activities	**Units**	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($)	Funding ($)	Priority C, H, M, L
1 Ground Surveys	ha	6 600	6 600	6 600	6 600	6 600	$125	825000	H
3 Aerial Survey - overview	ha	3 000 000	3 000 000	3 000 000	3 000 000	3 000 000	0.026	78000	H
4 Aerial Surveys - detailed	ha	12 000	12 000	12 000	12 000	12 000	0.15	1800	H
Totals hectares		3 018 600	3 018 600	3 018 600	3 018 600	3 018 600			
5 Aerial Survey - overview	hrs flying time	15	15	15	15	15	400	6000	H
6 Aerial Surveys - detailed	hrs flying time	70	80	90	80	70	700	49000	H
7 Fall and burn treatment	trees	800	800	800	800	800	80	64000	H
9 Pheromone baiting	trees	1 000	1 500	2 000	1 500	1 000	30	30000	M
11 Other (Heli-logging)	trees	10 000	12 000	15 000	12 000	10 000	50	500000	H
Totals		11800	15300	17800	15300	11800		$1,553,800	

Table 4.2.3.6 Forest Health Information Subprogram

		Five-year Plan Goals					**Annual Plan 2001/02**		
Activities	**Units**	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($)	Funding ($)	Priority C, H, M, L
1 Ground Survey	ha	0	0	0	0	0	$0	$0	
Totals hectares		0	0	0	0	0			
2 Aerial Survey - overview*	hrs flying time	0	0	0	0	0	0	0	
Studies/ Operational Trials:									
3 · Hazard and risk	number	0	0	0	0	0	0	0	
4 · Impact analyses (G&Y)	number	0	0	0	0	0	0	0	
5 · Treatments	number	0	0	0	0	0	0	0	
6 Training Courses	number	0	0	0	0	0	0	0	
7 Other		0	0	0	0	0	0	0	
Totals		0	0	0	0	0	$0	$0	

Table 4.2.3.7Performance Indicators for Protecting Current Inventory Sub-program (based on funding at plan level)

Activity	Unit	Anticipated Achievments[25]
Aerial Surveys - Overview	est. % of forested area surveyed/hrs flown/ ha	
Aerial Surveys - Detailed	est. % of susceptible area surveyed/ hrs flown/ ha	
Ground Surveys	est. % of aerially detected infestations gd. surveyed/ ha	
Treatments	est. % of currently detected infestations addressed by:	
Expedited Harvesting	% / Cubic metres	
Deferred and baited	% / Cubic metres / trees baited	
Single Tree treatments:	% / Cubic metres	
Single Tree Removal	*Cubic metres*	
Fall and Burn Treatment	*Trees*	
MSMA Treatment	*Trees*	
Abandoned for salvage	% / Cubic metres	
Unsalvagable	% / Cubic metres	
Defoliator Treatment	Hectares treated	
		estimated percentage to the nearest 20%

Table 4.2.3.8Performance Indicators for Forest Health Information Sub-program (based on funding at plan level)

Activity	Unit	Anticipated Achievments
Aerial Surveys - overview[26]	% of district mapped (ha)	
Ground Surveys	ha	
Studies/ Operational Trials:		
· Hazard and risk	Studies completed/ initiated/maintained	
· Impact analyses (G&Y)	Studies completed/ initiated/maintained	
· Treatments	Studies completed/ initiated/maintained	
Training Courses	Courses (# trained)	

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[25] estimated percentage to the nearest 20%

[26] Reported in this table if District has no Protection of Current Inventory Sub-progam

4.2.4 FORT ST. JAMES FOREST DISTRICT

The Forest Health Maintenance Resource Management Plan has two components: the Protection of Current Inventory Sub-program, and the Forest Health Information Sub-program. Table 4.2.3.1 presents the budget estimates for both sub-programs. The major emphasis in the Fort St. James Forest District is the former, however, consisting of the control of epidemic scale infestations in the District.

Table 4.2.4.1 Forest Health Maintenance Budgeting and Allocation Worksheet

Sub-Program	**Sub-Program Component**	**Required April 1, 2000 ($)**	**Total for 2000/01 ($)**
Protection of Current Inventory Sub-program			
	MoF Bark Beetle	232 500	791 000
Forest Health Information Sub-program	General	240 250	798 750
	Total	$472 750	$1 589 750

4.2.4.1 PROTECTION OF CURRENT INVENTORY SUB-PROGRAM - MOUNTAIN PINE BEETLE

Management Objectives

The Canadian Forest Service, Forest Insects and Disease Survey first observed bark beetle outbreaks in the Fort St. James Forest District in the 1930's. The British Columbia Ministry of Forests now maps all bark beetle infestations on an annual basis. The survey completed in 1999 identified 11 630 infestation sites of varying sizes. The total area of mountain pine beetle infestation surveyed is 13 743 hectares, totalling approximately 4 810 050m^3. Infestation levels dropped in this survey as compared with previous years because the survey method used a more operational approach rather than an overview approach, resulting in smaller and more accurate infestation values. Also, due to their immense areas, all balsam bark beetle infestation areas were not tallied.

The main goal of the Fort St. James District Bark Beetle Strategic Plan pertaining to this proposal is to balance the salvage of timber with the protection of non-timber resources and to minimize losses from bark beetles.

Management Strategies

To facilitate planning, priortization of activities, and assignment of landscape level strategies, the Fort St. James District has been stratified into units, as identified on Figure 1. For ease of administration and to co-ordinate bark beetle strategic planning with landscape unit planning stratification was based on landscape unit boundaries. Thirty-four units were created. Some were subdivided based on differences in access availability. Different beetle priority rankings were applied based on incidence, susceptibility and access. Overall strategies were also applied based on these same criteria as well as impacts to other, non-timber resource

STRATEGY 1: MAINTAIN LOW

The Maintain Low strategy is applicable in chronically infested stands where the spread of the beetle has been reduced to a level that can be dealt with under a base or normal level program and within the allowable annual cut. This also includes areas where the outbreak has collapsed but where extensive susceptible stands remain. The strategy can be considered as a sub-set of Suppression. The intent is to accommodate expected beetle activity in the normal planning process and to deal with new infestation polygons as they arise. Detection is critical for application in harvesting programs and other treatments. All major access will be in place or planned in conjunction with hazard rating

A Maintain low program will incorporate all relevant activities to prevent rapid increases in the beetle population. A Maintain Low strategy is a base level program and would continue indefinitely.

The southern third of the District is in the Maintain Low strategy. Portions of the Fall/Silver and Sustut Bear Forest Health Management Units (FHMU) as well as Lovell, Dust Creek and East Takla Lake FHMU's are also Maintain Low. These are areas with at least some level of access development as well as chronic infestation levels.

STRATEGY 2: HOLDING ACTION

The intent of a holding action strategy is to maintain an existing outbreak at a relatively static level. It is a delaying strategy until adequate resources are available or access created, allowing for more aggressive management. This strategy is appropriate in areas with chronic beetle infestations, some of which are too large to deal with using single tree treatments, or where access is poorly developed for directed harvesting. Holding action would be recommended for a FHMU or a sub-unit where aggressive suppression would be appropriate but the unit has a lower priority than other areas. It could also be used where resources are inadequate to deal with all infestations.

A holding action is a temporary strategy and should not be maintained indefinitely. There must be a clear time horizon for access development to permit more aggressive sanitation harvesting and for the application of other control options. Depending on the hazard and risk of the area, the infestations should be dealt with in two to three years.

Chuchi, Tchentlo and Frypan FHMU's are those with a Holding Action.

STRATEGY 3: MONITOR STRATEGY

The Monitor zone has been confined to the Entiako Park within the Vanderhoof Forest District It is predominantly comprised of moderate to high susceptible stands currently under the influence of high to severe beetle incidence. This area includes SBS, SBPS and ESSF ecosystems. This strategy is applied to areas where the management efforts allowed within parks and provided for by available resources would be ineffective in substantially reducing the beetle population and subsequent levels of damage. The only management under consideration for the Entiako Park is controlled burns with the objectives of host removal, fuel reduction and reducing beetle populations.

STRATEGY 4: SALVAGE

This strategy is applied to areas where management efforts would be ineffective in substantially reducing the beetle population and subsequent levels of damage. Areas where a salvage strategy is appropriate usually have extensive outbreaks covering a large proportion of susceptible stands and where access is planned or possible within a five-year period. Infested areas will have relatively high proportions of red and grey attack indicating that the outbreak has been ongoing for several years. Smaller, moderate, or low hazard stands are commonly infested.

BMUs with a salvage strategy are basically left alone and no resources are allocated to control. As harvesting capacity becomes available, timber in these areas can be salvaged and the sites returned to production. Long-term silvicultural strategies would be implemented at this point.

STRATEGY 4: ABANDON (NO CONTROL)

This strategy is applied to areas where management efforts would be ineffective in substantially reducing the beetle population and subsequent levels of damage, or where there is no short-term (less than five years) possibility of salvaging dead timber. This may be due to management constraints such as wilderness or parks, or because access cannot be put in place before substantial merchantable degradation of the dead material occurs. The abandon strategy includes survey tactics but not treatment tactics.

Resource Values at Risk

The most significant risk from the mountain pine beetle, other bark beetles and also 2-year cycle budworm is the impact to the long-term timber supply. Approximately seventy percent of the District, 2.7 million hectares, is classified as mature to over mature timber. Sub-Alpine Fir (Balsam) is the leading species at 39% with Lodgepole Pine at 30%, Spruce at 21%, Douglas-fir at 1% and other species (deciduous and black spruce) at 9%. The Combination of a skewed age class, species distribution and an effective fire suppression program has facilitated the expansion of bark beetle populations resulting in an average estimated loss of 179,000m^3/yr.

Dendro-ecological studies (Alfaro and Zhang, 1999) have found that two-year cycle budworm outbreaks caused radial growth reductions averaging 16-21% per year in spruce and balsam. Considering that 840 000 hectares of forest are infested with budworm, radial growth losses are significant. Mortality levels are not known at this time.

Mountain pine beetle also poses risks to Parks and Proposed Protected Areas in the District. Management activities in Parks and Protected areas are not included in this proposal.

Other values at risk due to accelerated harvest include wildlife habitat, recreation, scenic values, and watersheds. Unless bark beetle infestations are rigorously attacked the risk of loss of these values will increase.

Bark Beetle Status

Mountain pine beetle hazard is broken down as follows (following the Shore Safranyik model):

Table 4.2.4.2Distribution of MPB Hazard Classes in the Fort St. James Forest District

Hazard Rating IBM	Hectares	Percent total
Nil	1 727 287.8	73.9
Low	193 318.7	8.3
Moderate	330 432.8	14.1
High	87 040.4	3.7

Most susceptible types for mountain pine beetle are in the lower half of the District, close to the main centre of Fort St. James and many of the First Nations Reservations. The upper latitudes of the District contain stands of other species and a lot of unmerchantable/inoperable area. Twenty six point one percent of the District is susceptible to mountain pine bark beetle. Although this percent may seem small comparatively, due to the size of the District it incorporates a very large area (610 791.9 hectares) comparable to and, in some cases, larger than the total area of other Districts in the province.

Table 4.2.4.3 Approximate Area Infested in 1995

Beetle Species	**1995**	**1996**[27]	**1997**[28]	**1998**[29]	**1999**
Balsam bark beetle[30]	37 662	52 436	15 917	14 654	175
Mountain pine beetle	21 048	32 323	38 505	38 096	13 076
Spruce beetle	7 753	3 523	2 040	2 182	342
Douglas fir bark beetle	1 064	2 879	2 825	2 388	150
Total	67 527	91 161	59 287	57 320	13 743

As indicated in Table 4.2.4.3, mountain pine beetle levels are significant. The three phases of beetle attack, endemic, incipient and epidemic, are represented throughout various areas of the District.

At this time we have a mapped attack *vs* susceptible area ration of 1:44, which tells us that there is one infested hectare for every 44 susceptible hectares.

Average red to green attack ratio in 1999 was 1:4, though some areas were as high as 1:35. Infested areas are expected to increase in 2000, especially considering the mild winter and minimal amounts of winter mortality. Success of summer flights is still dependent on summer temperatures.

General Approach

The entire bark beetle program in the Fort St. James District is co-ordinated among District staff, licensees and SBFEP through Bark Beetle Strategy meetings, Planning Meetings, one-on-one Licensee/District meetings and Round-table discussions. Discussions on bark beetle strategies and progress can occur as often as daily to once a week or quarterly dependent upon the scope of bark beetle problem each individual licensee is responsible for. Major forest licensees are involved in all aspects of the Bark Beetle program including, planning, detailed aerial surveys, single tree treatments and ground reconnaissance. Environment and other stakeholders (Parks, First Nations, Woodlot licensees, private landowners, Environment) are involved in all aspects of the planning and strategy sessions.

Planned Management Activities

The planned management activities for 2000/2001 are summarized in Tables 4.2.3.2 and 3.

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[27] **66%of the district was mapped in 1996**

[28] **2% of the district was mapped in 1997**

[29] **66% of the district included in this tally**

[30] **Note: Reduction in Balsam Beetle attacked area from 1995 to 1999 is a result of the huge attacked areas of balsam beetle not being feasible to map, because of the size. Reduction in total amount of area attacked in 1999 due to detailed survey methodology.**

Table 4.2.4.4 Parks Beetle Funding

Activity	Priority #1		Priority #2	
	Output (units)	Expenditure	Output (units)	Expenditure
Aerial overview survey*	ha		ha	
Detailed aerial survey	ha		ha	
Ground survey	ha		ha	
Photography	ha		ha	
Fall & Burn	400 trees	$25 000	# trees	
MSMA treatment	# trees		# trees	
Pheromones	# baits		# baits	
Trap trees	# trees		# trees	
Prescribed burn	ha		ha	
Other (describe below)		$25 000		
Total		**$50 000**		

Other: Ecosystem Planning for Flemming PPA- includes forest health objectives.

Table 4.2.4.5 Forest Service Beetle Funding

Activity	Priority #1		Priority #2	
	Output (units)	Expenditure	Output (units)	Expenditure
Aerial overview survey*	ha		ha	
Detailed aerial survey	1 000 000ha	$120 000	ha	
Ground survey	300 ha	$372 000	ha	
Photography	4000 ha	$70 000	ha	
Fall & Burn	5700 trees	$400 000	# trees	
MSMA treatment	7000 trees	$290 000	# trees	
Pheromones	4000 baits	$175 000	# baits	
Trap trees	350 trees	$20 000	# trees	
Harvest	30 ha	$35 000	ha	
Other[31]		$100 000		
Total		**$1 582 000**		

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[31] Operational planning, LU planning, Haul and Mill exemption monitoring program

4.2.4.2 FOREST HEALTH INFORMATION SUB-PROGRAM - GENERAL

Management Objectives

By maintaining healthy forests, stumpage revenues are maximized. Reducing unsalvageable losses will sustain and increase harvest levels (preventing short-term AAC uplifts and delaying fall downs). It also minimizes or prevents the early harvest of second growth stands before culmination age, in situations where catastrophic forest health events have led to a shortfall in mature volume availability.

Our goal is to manage forest health strategically and proactively, investing towards a steady state of allowable risks. It is no longer acceptable to manage epidemic infestations in the style of the 1980's. Therefor, our management objectives are to maintain ongoing monitoring systems for potential risks, such as defoliators, in order to prescribe acceptable management tactics to minimize damage.

Resource Values

The forest profile is predominantly mature lodgepole pine types. With the harvest of mature lodgepole pine types, a shift in the age profile is occurring and more young stands are being created. Young pine face a multitude of pests that could impact on its development. However, due to the higher priority of managing the current mountain pine beetle epidemic, general forest health funds are proposed for detecting and treating bark beetle infestations rather than managing pests in immature stands.

Planned Activities

Further work, co-ordinated by the regional office, to determine significance of two-year cycle budworm and to operationalize research on the problem will be completed. Also, in order to balance funding requests half of what was identified in the bark beetle section is requested to come from forest health funding. In this way funding allocations will not be weighted towards one account.

Planned Forest Health Information Activities for 2000/2001are summarized in Table 4.2.4.6.

Table 4.2.4.6 Planned Forest Health Information Activities

Proposed Activity (in order of priority)	Expenditure ($)
#1 Plot remeasurement, analyse data, develop hazard models, do	$7 750
Total	**$7 750**

Forest Health Maintenance Resource Management Plan

The five year budget and activity projections for both sub-programs of the Vanderhoof Forest Health RMP are presented in Tables 4.2.4.6.and 7. The performance indicators for the former sub-program are estimated in Table 4.2.4.8.

Table 4.2.3.6 Protection of Current Inventory Sub-Program

Activities	Units	Five-year Plan Goals					Annual Plan 2001/02		
		2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($)	Funding ($)	Priority C, H, M, L
1 Ground Surveys	ha	300	300	300	300	300	1240	502000	H
2 Defoliator spraying	ha								
3 Aerial Surveys - overview	ha	1000000	1000000	1000000	1000000	1000000	0.026	26000	H
4 Aerial Surveys - detailed	ha	1000000	1000000	1000000	1000000	1000000	0.12	120000	H
Totals hectares									
5 Aerial Survey - overview	hrs flying time								
6 Aerial Surveys - detailed	hrs flying time								
7 Fall and burn treatment	trees	5700	5700	5700	5700	5700	70	399000	H
Trap trees	trees	350	350	350	350	350	57	20000	
8 MSMA treatment	trees	7000	7000	7000	7000	7000	41	290000	H
9 Pheromone baiting	trees	4000	4000	4000	4000	4000	43	175000	H
10 Studies- Ecosystem planning	Projects	1						25000	
Studies – Ops. Planning	Projects	1						100000	M
11 Other – aerial photography	trees	4000					17.5	70000	M
Other - Harvest	ha	30						35000	M
Totals								$1,762,000	

Table 4.2.4.7 Forest Health Information Subprogram

Activities	Units	Five-year Plan Goals					Annual Plan 2001/02		
		2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($)	Funding ($000)	Priority C, H, M, L
7 Other- 2 Year Budworm monitoring and analysis	Project	1	0	0	0	0		7750	M
Totals		0	0	0	0	0	$0	$7,750	

Table 4.2.4.8 Performance Indicators for Protecting Current Inventory Sub-program (based on funding at plan level)

Activity	Unit	Anticipated Achievments[32]
Aerial Surveys - Overview	est. % of forested area surveyed/hrs flown/ ha	
Aerial Surveys - Detailed	est. % of susceptible area surveyed/ hrs flown/ ha	
Ground Surveys	est. % of aerially detected infestations gd. surveyed/ ha	
Treatments	est. % of currently detected infestations addressed by:	
Expedited Harvesting	% / Cubic metres	
Deferred and baited	% / Cubic metres / trees baited	
Single Tree treatments:	% / Cubic metres	
Single Tree Removal	*Cubic metres*	
Fall and Burn Treatment	*Trees*	
MSMA Treatment	*Trees*	
Abandoned for salvage	% / Cubic metres	
Unsalvagable	% / Cubic metres	
Defoliator Treatment	Hectares treated	
		estimated percentage to the nearest 20%

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[32] Estimated percentage to the nearest 20%

Table 4.2.4.9Performance Indicators for Forest Health Information Sub-program (based on funding at plan level)

Activity	Unit	Anticipated Achievments
Aerial Surveys - overview[33]	% of district mapped (ha)	
Ground Surveys	ha	
Studies/ Operational Trials:		
· Hazard and risk	Studies completed/ initiated/maintained	
· Impact analyses (G&Y)	Studies completed/ initiated/maintained	
· Treatments	Studies completed/ initiated/maintained	
Training Courses	Courses (# trained)	

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[33] Reported in this table if District has no Protection of Current Inventory Sub-progam

4.2.5 MACKENZIE FOREST DISTRICT

The Forest Health Maintenance Resource Management Plan has two components: the Protection of Current Inventory Sub-program, and the Forest Health Information Sub-program. Table 4.2.5.1 presents the budget estimates for both sub-programs. The major emphasis in the Mackenzie Forest District is the former, however, consisting of the control of epidemic scale infestations in the District.

Table 4.2.5.1 Bark Beetle Budgeting and Allocation Worksheet

Sub-Program	**Sub-Program Component**	**Required April 1, 2000 ($)**	**Total for 2000/01 ($)**
Protection of Current Inventory Sub-program			
	MoF Bark Beetle	107 500	287 500
Forest Health Information Sub-program	General	240 117 850	164 350
	Total	$225 350	$451 850

4.2.5.1 PROTECTION OF CURRENT INVENTORY SUB-PROGRAM - MOUNTAIN PINE BEETLE

Management Objectives

The district goal is manage forest health strategically and proactively investing towards a steady state of allowable risks.

Although the Mackenzie District has been effective in maintaining beetle populations in the past it has been done more reactively than proactively. Maintaining beetle populations in this matter threatens the management and conservation of forest resources as it works against higher level plan objectives(LU Planning-Biodiversity/RMZ objectives-wildlife habitat/recreation) and the Timber Supply of the TSA.

District management objectives are to:

- maintain an ongoing monitoring system for potential risks in order to prescribe acceptable management tatics to minimise damage and,
- develop and implement hazard and risk rating systems for both young and old stands(old stands this year) and,.
- Using hazard/risk rating system , higher level plan objectives and timber supply analysis objectives develop a TSA forest health strategy co-operatively with our licensees. (A committee was struck last year and have to date completed hazard mapping. The next step is to fashion map and data products similar to that developed by the Fort Saint James Forest District and Stuart Taylor from Prince George Region. The difference will be that we will attempt to do the strategy on a LU basis so it may used in development and maintenance of higher level plan objectives.)
- Conduct pest surveys on pre 1987 blocks determined to have high incidence of rusts and weevil.

This information will be used in part to determine the extent of the problem in the TSA and to assist in the development of hazard ratings and the execution of a forest health strategy for forest health pests within plantations. The forest health strategy for immature pests is hoped to be developed in the 2001/2002 fiscal year. The magnitude of the problem is high, particularly in the parsnip, blackwater and strandberg LU's.

Resource Values at Risk

The resource values at risk are those associated with higher level plan objectives (ie DMK draft LRMP and LUP objectives) and the timber supply or annual allowable cut (AAC)apportionment of the district.

The Mackenzie TSA has an approximate Timber Land base of 1.1 million hectares of which leading Balsam,Spruce and Pine stands constitute 16%,37% and 47% respectively. In general the AAC of the district(approx.2.9mill) recognises the specie profile of the district.

All proposed protected areas have been included in the forest health strategy. All parks including ecological reserves have also been included but the forest health strategy only includes monitoring this year in recognition that past has indicated low incidence of Bark beetle with exception of Balsam Bark Beetle.

Bark Beetle Status

R values and susceptible area ratio's are not available at this time and are pending TSA forest health strategy funding which includes an accessible data base.

Random walkthroughs this spring indicate an incline in spruce bark beetle particularly in those polygons we deemed in the past to be dormant. This should become evident with this years sketch mapping showing red tops. For the past five years we have seen little activity.

Mountain Pine beetle is expected to increase given activity in Fort St James district, brand new infestation areas last year from the previous year , hazard rating indicated in the vicinity of the polygons and the licensees inability to heli harvest last year(licensee baited).Over the past two years we have harvested annually about 300 hectares of mountain pine beetle and fell/burned approximately 50 trees. Last year through walkthroughs we saw for the first time, a large increase in lodgepole pine beetle.We anticipate to find the same results this year which complicates our ability to determine needs for walkthroughs and grid probes. As a result we will have to conduct more walkthroughs per mountain pine beetle infestation centre than would be normally expected.

We do not expect an increase in spruce budworm this year given we should be at the end of its cycle and last year we did not see a significant increase. We did however notice that adjacent drainages appear to be on separate cycles and as such we can not accurately determine the position of all the budworm in the cycle period. This should be determined in part by the continuation of spruce budworm project funded by the general forest health budget.

Balsam bark beetle is expected to incline as in past years. A funded forest health strategy should in part address the problem . We will continue to sketch map balsam bark beetle and where economically viable it will be harvested.

General Approach

Nothing extraordinary than conventional treatments are anticipated for proposed protected areas and other areas which follow under responsibility of the ministry of forests.

Following aerial sketch mapping , results are forwarded to licensees including small business. Areas of responsibility is generally determined by distance from proposed or active blocks and roads(1km for ground surveys/400meters for treatments) and then refined/finalised by a joint meeting between the ministry of forests and the licensees. Areas outside the distance above generally become a forest service responsibility unless there is a logging chance.

Planned Management Activities

The planned management activities for 2000/2001 are summarized in Tables 4.2.5.2.

Table 4.2.5.2 Protecting Current Forest Health Information Sub-program Planned Activities

Activity	Priority #1		Priority #2	
	Output (units)	Expenditure	Output (units)	Expenditure
Aerial overview survey (pests of immature stands)*	3 000 000 ha	$80 000	ha	
Detailed Aerial surveys	12 000 ha	$20 000	ha	
Fall and Burn	800 trees	$80 000		
Ground survey (pests of immature plantations)	6 600 ha	$100 000		
Pheromones	50 traps	$5 000		
Trap Trees	25 trees	$2 500		
Total		**$287 500**		

4.2.5.2 FOREST HEALTH INFORMATION SUB-PROGRAM - GENERAL

Planned Activities

Planned Forest Health Information Activities for 2000/2001are summarized in Table 4.2.5.3.

Table 4.2.5.3 Forest Health Information Sub-program Planned Activities

Activity	Priority #1		Priority #2	
	Output (units)	Expenditure	Output (units)	Expenditure
Aerial overview survey (pests of immature stands)*	1 000 000 ha	$30 000	ha	
Ground survey (pests of immature plantations)	1 500 ha	$50 000	ha	
Other a) mapping database and TSA Forest Health Strategy;	Strategic plan	$75 000		
Other b) Spruce Budworm	report	$9 350		

research				
Total		**$164 350**[34]		

Forest Health Maintenance Resource Management Plan

The five year budget and activity projections for both sub-programs of the Vanderhoof Forest Health RMP are presented in Tables 4.2.5.4.and 5. The performance indicators for the former sub-program are estimated in Table 4.2.5.6 and 7.

Table 4.2.5.4 Protection of Current Inventory Sub-Program

		Five-year Plan Goals					Annual Plan 2001/02		
Activities	**Units**	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($)	Funding ($)	Priority C, H, M, L
1 Ground Surveys	ha	6600	6600	6600	6600	6600	15	100000	H
3 Aerial Survey - overview	ha	3000000	3000000	3000000	3000000	3000000		80000	
4 Aerial Surveys - detailed	ha	12000	12000	12000	12000	12000	1.66	20000	
Totals hectares		3,012,000	3,012,000	3,012,000	3,012,000	3,012,000			
7 Fall and burn treatment	trees	800	800	800	800	800	0	80000	
Trap trees	trees	25	25	25	25	25	0	2500	
9 Pheromone baiting	trees	50	50	50	50	50	0	5000	
Totals		875	875	875	875	875	$1	$287,500	

Table 4.2.4.7 Forest Health Information Subprogram

		Five-year Plan Goals					Annual Plan 2001/02		
Activities	**Units**	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($)	Funding ($)	Priority C, H, M, L
1 Ground Survey	ha	1500	1500	1500	1500	1500	$33	50000	
3 Aerial overview survey	ha	1000000	1000000	1000000	1000000	1000000		30000	
Totals hectares		0	0	0	0	0			
Studies/ Operational Trials: Spruce Budworm research		1						9350	
7 Other – GIS database and TSA Forest Health strategy	project	1	0	0	0	0	0	75000	
Totals		0	0	0	0	0	$0	$164,350	

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[34] Note: original request received April 1, 2000 was $108 500, which was adjusted for spruce budworm research not anticipated at the time of the original request.

Table 4.2.4.8Performance Indicators for Protecting Current Inventory Sub-program (based on funding at plan level)

Activity	Unit	Anticipated Achievments[35]
Aerial Surveys - Overview	est. % of forested area surveyed/hrs flown/ ha	
Aerial Surveys - Detailed	est. % of susceptible area surveyed/ hrs flown/ ha	
Ground Surveys	est. % of aerially detected infestations gd. surveyed/ ha	
Treatments	est. % of currently detected infestations addressed by:	
Expedited Harvesting	% / Cubic metres	
Deferred and baited	% / Cubic metres / trees baited	
Single Tree treatments:	% / Cubic metres	
Single Tree Removal	*Cubic metres*	
Fall and Burn Treatment	*Trees*	
MSMA Treatment	*Trees*	
Abandoned for salvage	% / Cubic metres	
Unsalvagable	% / Cubic metres	
Defoliator Treatment	Hectares treated	
		estimated percentage to the nearest 20%

Table 4.2.4.9Performance Indicators for Forest Health Information Sub-program (based on funding at plan level)

Activity	Unit	Anticipated Achievments
Aerial Surveys - overview[36]	% of district mapped (ha)	
Ground Surveys	ha	
Studies/ Operational Trials:		
· Hazard and risk	Studies completed/ initiated/maintained	
· Impact analyses (G&Y)	Studies completed/ initiated/maintained	
· Treatments	Studies completed/ initiated/maintained	
Training Courses	Courses (# trained)	

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[35] Estimated percentage to the nearest 20%

[36] Reported in this table if District has no Protection of Current Inventory Sub-progam

4.2.6 DAWSON CREEK FOREST DISTRICT

Table 4.2.6.1 Protection of Current Inventory Sub-Program

	Activities	Units	Five-year Plan Goals 2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Annual Plan 2001/02 Unit Cost ($)	Funding ($)	Priority C, H, M, L
1	Ground Surveys	ha	0	0	0	0	0	$0	$0	
2	Defoliator spraying	ha	0	0	0	0	0	0	0	
3	Aerial Survey - overview	ha	0	0	0	0	0			
4	Aerial Surveys - detailed	ha	0	0	0	0	0			
Totals hectares			0	0	0	0	0			
5	Aerial Survey - overview	hrs flying time	15	15	15	15	15	800	12000	H
6	Aerial Surveys - detailed	hrs flying time	0	0	0	0	0	0	0	
7	Fall and burn treatment	trees	0	0	0	0	0	0	0	
8	MSMA treatment	trees	0	0	0	0	0	0	0	
9	Pheromone baiting	trees	0	0	0	0	0	0	0	
10	Studies	number	0	0	0	0	0	0	0	
11	Other: Well-site test flaring (aerial survey)		10	10	10	10	10	800	8000	H
	Totals		25	25	25	25	25		$20,000	

Table 4.2.6.2 Forest Health Information Subprogram

	Activities	Units	Five-year Plan Goals 2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Annual Plan 2001/02 Unit Cost ($)	Funding ($000)	Priority C, H, M, L
1	Ground Survey	ha	0	0	0	0	0	$0	$0	
Totals hectares			0	0	0	0	0			
2	Aerial Survey - overview*	hrs flying time	0	0	0	0	0	0	0	
	Studies/ Operational Trials:									
3	- Hazard and risk	number	0	0	0	0	0	0	0	
4	- Impact analyses (G&Y)	number	0	0	0	0	0	0	0	
5	- Treatments	number	0	0	0	0	0	0	0	
6	Training Courses	number	0	0	0	0	0	0	0	
7	Other		0	0	0	0	0	0	0	
	Totals		0	0	0	0	0	$0	$0	

Table 4.2.6.3Performance Indicators for Protecting Current Inventory Sub-program (based on funding at plan level)

Activity	Unit	Anticipated Achievments[37]
Aerial Surveys - Overview	est. % of forested area surveyed/hrs flown/ ha	100%
Aerial Surveys - Detailed	est. % of susceptible area surveyed/ hrs flown/ ha	0
Ground Surveys	est. % of aerially detected infestations gd. surveyed/ ha	0
Treatments	est. % of currently detected infestations addressed by:	0
Expedited Harvesting	% / Cubic metres	0
Deferred and baited	% / Cubic metres / trees baited	0
Single Tree treatments:	% / Cubic metres	0
Single Tree Removal	*Cubic metres*	0
Fall and Burn Treatment	*Trees*	0
MSMA Treatment	*Trees*	0
Abandoned for salvage	% / Cubic metres	0
Unsalvagable	% / Cubic metres	13 145 m3 (fire)
		11 400 m3 (wind)
		29 640m3 (spruce beetle)
		?m3 (tomentosus root rot)
Defoliator Treatment		0
		approx. 5,000m3 Small Scale Salvage Program

Table 4.2.3.4Performance Indicators for Forest Health Information Sub-program (based on funding at plan level)

Activity	Unit	Anticipated Achievments
Aerial Surveys - overview[38]	% of district mapped (ha)	0
Ground Surveys	ha	0
Studies/ Operational Trials:		0
· Hazard and risk	Studies completed/ initiated/maintained	0
· Impact analyses (G&Y)	Studies completed/ initiated/maintained	0
· Treatments	Studies completed/ initiated/maintained	0
Training Courses	Courses (# trained)	0

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[37] estimated percentage to the nearest 20%

[38] Reported in this table if District has no Protection of Current Inventory Sub-progam

4.2.7 FORT ST. JOHN FOREST DISTRICT

Table 4.2.7.1 Protection of Current Inventory Sub-Program

Activities	Units	Five-year Plan Goals 2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Annual Plan 2001/02 Unit Cost ($)	Funding ($)	Priority C, H, M, L
1 Ground Surveys	ha	0	0	0	0	0	$0	$0	
2 Defoliator spraying	ha	0	0	0	0	0	0	0	
3 Aerial Survey - overview	ha	0	0	0	0	0			
4 Aerial Surveys - detailed	ha	0	0	0	0	0			
Totals hectares		0	0	0	0	0			
5 Aerial Survey - overview	hrs flying time	0	20	0	20	0	0	0	
6 Aerial Surveys - detailed	hrs flying time	10	0	10	0	10	400	4000	H
7 Fall and burn treatment	trees	0	0	0	0	0	0	0	
8 MSMA treatment	trees	0	0	0	0	0	0	0	
9 Pheromone baiting	trees	0	0	0	0	0	0	0	
10 Studies	number	0	0	0	0	0	0	0	
11 Other		0	0	0	0	0	0	0	
Totals		10	20	10	20	10	$0	$4,000	

Table 4.2.7.2 Forest Health Information Subprogram

Activities	Units	Five-year Plan Goals 2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Annual Plan 2001/02 Unit Cost ($)	Funding ($)	Priority C, H, M, L
1 Ground Survey	ha	0	0	0	0	0	$0	$0	
Totals hectares		0	0	0	0	0			
2 Aerial Survey - overview*	hrs flying time	0	0	0	0	0	0	0	
Studies/ Operational Trials:									
3 · Hazard and risk	number	0	0	0	0	0	0	0	
4 · Impact analyses (G&Y)	number	0	0	0	0	0	0	0	
5 · Treatments	number	0	0	0	0	0	0	0	
6 Training Courses	number	0	0	0	0	0	0	0	
7 Other		0	0	0	0	0	0	0	
Totals		0	0	0	0	0	$0	$0	

Table 4.2.7.3Performance Indicators for Protecting Current Inventory Sub-program (based on funding at plan level)

Activity	Unit	Anticipated Achievments[39]
Aerial Surveys - Overview	est. % of forested area surveyed/hrs flown/ ha	
Aerial Surveys - Detailed	est. % of susceptible area surveyed/ hrs flown/ ha	
Ground Surveys	est. % of aerially detected infestations gd. surveyed/ ha	
Treatments	est. % of currently detected infestations addressed by:	
Expedited Harvesting	% / Cubic metres	
Deferred and baited	% / Cubic metres / trees baited	
Single Tree treatments:	% / Cubic metres	
Single Tree Removal	*Cubic metres*	
Fall and Burn Treatment	*Trees*	
MSMA Treatment	*Trees*	
Abandoned for salvage	% / Cubic metres	
Unsalvagable	% / Cubic metres	
Defoliator Treatment	Hectares treated	
		estimated percentage to the nearest 20%

Table 4.2.7.4Performance Indicators for Forest Health Information Sub-program (based on funding at plan level)

Activity	Unit	Anticipated Achievments
Aerial Surveys - overview[40]	% of district mapped (ha)	
Ground Surveys	ha	
Studies/ Operational Trials:		
· Hazard and risk	Studies completed/ initiated/maintained	
· Impact analyses (G&Y)	Studies completed/ initiated/maintained	
· Treatments	Studies completed/ initiated/maintained	
Training Courses	Courses (# trained)	

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[39] estimated percentage to the nearest 20%

[40] Reported in this table if District has no Protection of Current Inventory Sub-progam

4.2.8 FORT NELSON FOREST DISTRICT

The Forest Health Maintenance Resource Management Plan has two components: the Protection of Current Inventory Sub-program, and the Forest Health Information Sub-program. Table 4.2.8.1 presents the budget estimates for both sub-programs. The major emphasis in the Fort Nelson Forest District is the former, however, consisting of the control of epidemic scale infestations in the District.

Table 4.2.8.1 Forest Health Budgeting and Allocation Worksheet

Sub-Program	**Sub-Program Component**	**Required April 1, 2000 ($)**	**Total for 2000/01 ($)**
Protection of Current Inventory Sub-program			
	MoF Bark Beetle	107 500	287 500
Forest Health Information Sub-program	General	240 117 850	164 350
	Total	$225 350	$451 850

4.2.8.1 PROTECTION OF CURRENT INVENTORY SUB-PROGRAM - MOUNTAIN PINE BEETLE

Management Objectives

The objectives of these forest health maintenance activities include monitoring for spruce budworm and to prioritize areas for harvest. The permanent sample plots will also allow us to monitor the mortality as a result of defoliation from the spruce budworm.

2000 overview survey showed an increase in eastern budworm defoliation to the point that warrants treatment to protect high value spruce stands and some recently regenerated stands. Decreased funding will impact the ability to implement timely treatments and salvage operations, resulting in a large amount of timber being lost.

Table 4.2.8.1 Protection of Current Inventory Sub-Program

		Five-year Plan Goals					**Annual Plan 2001/02**		
Activities	**Units**	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($)	Funding ($)	Priority C, H, M, L
1 Ground Surveys	plots	15	15	15	15	15	$1 000	15000	H
2 Defoliator spraying	ha	0	0	0	0	0	0	0	
3 Aerial Survey - overview	hrs. flying time	40	40	40	40	40	$860	35000	C
4 Aerial Surveys - detailed	ha	10 000	10 000	10 000	10 000	10 000	$1	10000	C
Totals hectares		10 000	10 000	10 000	10 000	10 000		$60,000	

Table 4.2.8.2 Forest Health Information Subprogram

		Five-year Plan Goals					**Annual Plan 2001/02**		
Activities	**Units**	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Unit Cost ($)	Funding ($000)	Priority C, H, M, L
1 Ground Survey	ha	0	0	0	0	0	$0	$0	
Totals hectares		0	0	0	0	0			

2	Aerial Survey - overview*	hrs flying time	0	0	0	0	0	0	0	
	Studies/ Operational Trials:									
3	· Hazard and risk	number	0	0	0	0	0	0	0	
4	· Impact analyses (G&Y)	number	0	0	0	0	0	0	0	
5	· Treatments	number	0	0	0	0	0	0	0	
6	Training Courses	number	0	0	0	0	0	0	0	
7	Other		0	0	0	0	0	0	0	
	Totals		0	0	0	0	0	$0	$0	

Table 4.2.8.3Performance Indicators for Protecting Current Inventory Sub-program (based on funding at plan level)

Activity	Unit	Anticipated Achievments[41]
Aerial Surveys - Overview	est. % of forested area surveyed/hrs flown/ ha	
Aerial Surveys - Detailed	est. % of susceptible area surveyed/ hrs flown/ ha	
Ground Surveys	est. % of aerially detected infestations gd. surveyed/ ha	
Treatments	est. % of currently detected infestations addressed by:	
Expedited Harvesting	% / Cubic metres	
Deferred and baited	% / Cubic metres / trees baited	
Single Tree treatments:	% / Cubic metres	
Single Tree Removal	*Cubic metres*	
Fall and Burn Treatment	*Trees*	
MSMA Treatment	*Trees*	
Abandoned for salvage	% / Cubic metres	
Unsalvagable	% / Cubic metres	
Defoliator Treatment	Hectares treated	
		estimated percentage to the nearest 20%

Table 4.2.8.4Performance Indicators for Forest Health Information Sub-program (based on funding at plan level)

Activity	Unit	Anticipated Achievments
Aerial Surveys - overview[42]	% of district mapped (ha)	
Ground Surveys	ha	
Studies/ Operational Trials:		
· Hazard and risk	Studies completed/ initiated/maintained	
· Impact analyses (G&Y)	Studies completed/ initiated/maintained	
· Treatments	Studies completed/ initiated/maintained	
Training Courses	Courses (# trained)	

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[41] estimated percentage to the nearest 20%

[42] Reported in this table if District has no Protection of Current Inventory Sub-progam

5 ENHANCING ENVIRONMENTAL VALUES

5.1 EXECUTIVE SUMMARY

The Ministry of Environment, Lands and Parks and the Ministry of Forests were contracted by Forest Renewal B.C. to develop a resource management plan for the Prince George Forest Region in 1999. This portion of the resource management plan (RMP) is a revised version of the 1999 plan and summarises the Enhancing Environmental Values (EEV) component.

The EEV portion of the RMP is comprised of five (5) sections:the regional benchmark of watershed priorities as pertaining to water quality and fisheries values including recommended critical watersheds, identification of watersheds where there is insufficient information available to make a determination of their priority status within the region, effectiveness evaluations, a summary of consultation undertaken to develop the RMP and achieve consensus with government and industry stakeholders and recommendations related to the EEV portion of the RMP.

It should be noted that the white sturgeon was not included in the determination of critical or high priority watersheds for the Prince George Forest Region in the 1999 draft. White sturgeon is rare and endangered in British Columbia and is one of the most critical fish species in the Province. However, due to its habitat preference (mainstems of large rivers, e.g. Fraser and Nechako as well as large tributaries to these rivers such as the Bowron River), issues relating to restoration of the habitat and conservation of the species are beyond the scope of this RMP. To avoid confusion, white sturgeon is noted as being a critical fish species, and that its habitats are of the highest priority for protection and conservation. The white sturgeon was considered a critical fish species and included in the management planning of those watersheds where they occurred in the mainstems of tributary rivers (to the Fraser for example) such as the Bowron River.

Forest Renewal B.C.'s strategic objective for the EEV's WRP component is to restore 20% of the critical watersheds in the Prince George Forest Region by 2005. To identify the critical watersheds required to address this objective, a regional benchmark was developed. The regional benchmark identified 20 watershed units across the Prince George Forest Region for restoration by 2005. The predicted cost over the next 5 years to restore these watersheds is anticipated to be in excess of what Forest Renewal B.C. is going to spend in the EEV program if current annual funding levels are maintained over the next 5 years. Therefore, funding will have to be increased for the program, the percentage of critical watersheds restored by 2005 decreased, or the time frame for completing restoration increased beyond 2005.

The regional benchmark, in the 1999 draft, was also used to identify watersheds requiring Transition funding within the Prince George Forest Region. A Transition Watershed is one where substantial investment in watershed restoration activities has been made by Forest Renewal B.C. to date that does not have sufficient fish or domestic water supply uses to identify it as a critical watershed. Forest Renewal B.C. has indicated that funding for Transition Watersheds will be available in the 2000-2001 fiscal year to wrap up implementation of watershed restoration prescriptions and works in these non-critical watershed units. To date, monies have been spent on these Transition Watersheds within the region thus fulfilling the funding commitment of FRBC. Since not all of the Transition Watersheds could be completed or because some of the works will require maintenance in the years post restoration, FRBC has committed monies to Transition

Watersheds equal to 10% of the project value. These monies are described as 'hotspot' funding and are to be utilised in the 2001-2002 fiscal year.

Though new assessments are not currently being supported for funding by Forest Renewal B.C., watersheds where insufficient information exists to make a determination of their priority status (category five) were identified. In total 33 watershed units were identified as having insufficient information available to determine their status. When investment is available to fund new assessments, these watersheds should be investigated as a first priority to determine their fish values and need for restoration. These category five watersheds may become the next host of key watersheds to be restored in the five years following this RMP.

In 1999, consultation with government and industry stakeholders was undertaken to ensure that the RMP and its implications for future funding were understood and to achieve consensus for the recommendations coming out of the plan. During the summer of 2000, a formal letter of request was submitted to the Watershed Restoration Technicians in each of the Forest Districts. The intent of the letter was to summon interested parties (licensees, First Nations, stewardship groups, etc) to a RMP review meeting where the content and format of the RMP was discussed. This provided an opportunity for those parties to bring forward any contrary or erroneous data or for the input of ideas, recommendations and new information. The organisation of the meetings and the list of parties invited was the responsibility of the district WRP technicians.

5.2 INTRODUCTION

The Ministry of Forests and Ministry of Environment, Lands and Parks were contracted by Forest Renewal BC to deliver an integrated Resource Management Plan (RMP) for each of the three Land Based Program components by September 30, 1999. In 2000, this RMP was put forward to the stakeholders and interested parties for a complete revision of the EEV component of the plan.

Forest Renewal BC. has recently re-focused the strategic objective of the EEV program's primary component, the Watershed Restoration Program (WRP). The output of the revised objective is to restore fish habitat and or water quality values to 20% of the critical watersheds in the province by 2005. To appreciate this objective, one must understand what is meant by a critical watershed. Forest Renewal BC developed a procedure that allows for a determination of critical watersheds through the development of a regional watershed benchmark. The regional benchmark represents a ranking of watersheds across regional areas based on fish and or water supply values and is summarised in Appendix II of the Forest Renewal BC document: "Resource Planning Framework, Guidelines for the Development of Regional Resource Management Plans 2000/01".

The requirements of this EEV RMP revision was to review the regional watershed benchmark for the Prince George Forest Region (as established in the 1999 draft), identify watersheds with insufficient information to determine their priority, identify new or previously mis-identified key watersheds, identify the status of WRP projects for each watershed and their associated sub-basins, and consult with government and industry stakeholders regarding the outputs and recommendations of these components. The goal of the consultation process was to achieve consensus with government and industry stakeholders on the outputs and recommendations of the EEV portion of the Prince George Forest Region RMP

To revise the Prince George Forest Region EEV RMP, a committee comprised of John McInnis (Ministry of Environment) and Tim Silbernagel (Ministry of Forests) was struck by the Regional RMP steering committee. The EEV RMP committee was responsible for gathering information required to develop the plan, oversee the recommendations for both transition and critical watersheds, for soliciting input from government and industry stakeholders, and for compiling the output of all information gathered into a report for submission to the Regional RMP steering committee

5.3 REGIONAL BENCHMARK

The regional benchmark was developed following the six step process outlined in Appendix II of Resource Planning Framework, Guidelines for the Development of Regional Resource Management Plans 2000/01. The regional benchmark has been included with this revision of the RMP, and is considered essential information to the reader in understanding the framework of this RMP.

5.3.1 STEP 1: IDENTIFY FISH SPECIES AND CRITICAL STOCKS OF IMPORTANCE TO THE REGION

Meetings were held with Ministry of Fisheries staff and Ministry of Environment Lands and Parks Fish, Wildlife, and Habitat Protection staff form the Omineca - Peace region to determine what the species of interest and the critical stocks were for the purposes of this plan. Department of Fisheries and Oceans staff comment and input was solicited and where available included in this step. Reference was also made to salmon watershed planning profile developed by Department of Fisheries and Oceans for planning exercises such as this RMP.

Critical species for the Prince George Forest Region and their two or three letter Resource Inventory Committee (RIC) codes are listed in Table 5.1.

Table 5.1 Critical Fish Species in the Prince George Forest Region

Species	RIC Code
Arctic grayling	GR
bull trout	BT
specific stocks of lake trout	LT
specific stocks of kokanee	KO
brassy minnow	BMC
pearl dace	PDC
goldeye	GE
pygmy whitefish	PW
inconnu	IN
specific runs of chinook salmon	CH
coho salmon	CO
white sturgeon	WSG
Dolly Varden	DV
specific stocks of rainbow trout	RB
westslope cutthroat trout	WCT
chiselmouth chub	CMC
fathead minnow	FM
spoonhead sculpin	CRI
round whitefish	RW
lake cisco	CL
steelhead	ST
specific runs of sockeye salmon	SK

The species listed in table 5.1 represent provincially red- or blue-listed species, or species that are important from a First Nations sustenance, commercial, or recreational fishery perspective.

The results of this step were presented to government and industry stakeholders for input. The Vanderhoof district was the only source of new fisheries information within the region. Several watersheds had a variety of additional species to be included in the plan. The source of this information was stated as from MoF, MoELP, and DFO databases and licensee stream classification inventories'. Verifying the information that was submitted proved both difficult and time consuming, and because the information was not associated with category 1 watersheds, it was not included in the plan. The single exception to this was the Nithi watershed, where some of the submitted species were verified and the watershed considered a Very High regional fish priority. The Nithi River is a key element in the habitat of the Stellako rainbow trout, however it was not considered a Key Watershed.

5.3.2 STEP 2: ADOPT A BASE MAP FOR THE REGION

A suitable base map for the Prince George Forest Region had to be developed that was at a broad enough scale to ensure some level of information was available for each watershed, yet not so broad as to lump high and low priority fish and domestic water supply areas together.

The fish assessment unit and landscape unit maps developed for the LRMP process in each of the 8 forest districts in the Prince George Forest Region provided a map base that met these criteria. Fish assessment units are landscape units modified to isolate areas of high (or low) fish values (e.g. areas of watersheds upstream of impassable barriers are separated from fish bearing areas). Fish assessment map bases were available for Prince George, Vanderhoof, Fort St. James, Robson Valley and Mackenzie Forest Districts. As fish assessment unit maps were not available for the Peace sub-Region, landscape unit maps were used instead for the Dawson Creek, Fort St John and Fort Nelson Forest Districts.

A further advantage of using fish assessment and landscape unit maps was that information on fish species distribution and importance had already been compiled for the various LRMP tables. Thus we were able to transfer information on fish values from the LRMP to the Forest Renewal B.C. RMP process. By maintaining our map base consistently with that of the various district LRMP's, information developed from this planing exercise will also be available for future LRMP use and/or updates.

As some of the Target watersheds have changed and Transition watersheds are no longer a part of the Plan, the maps associated with the Plan had to be changed. Because the two sub-regions were using different coverages (fish assessment base maps and landscape unit maps), the maps were considered inaccurate. Several options were proposed by the Omineca GIS department for rectifying this situation. After careful consideration the RMP committee agreed that the best option was to have the Peace Sub-Region complete their own map. The Omineca maps and the Peace maps will be submitted as separate appendices. For each of the sub-regions there are two maps, one showing all of the Fish Units and their regional priorities for fish and domestic water supply and the other highlighting the Target watersheds.

The Fish Assessment and Landscape Unit maps identified 340 watershed units within the Prince George Forest Region. Table 5.2 indicates the number of watershed units by Forest District.

Table 5.2 Watershed Units within each Forest District

Forest District	Watershed Units
Prince George	47
Robson Valley	25
Vanderhoof	19
Fort St. James	44
Mackenzie	56
Dawson Creek	34
Fort St. John	43
Fort Nelson	72

The average size of the watershed units is 90 000 ha. The smallest unit is 276 ha; the largest unit is 406 000 ha.

5.3.3 STEP 3: SELECT IMPORTANT FISHERIES WATERSHEDS

(Those watersheds identified in STEP 1 that contain species/stocks /runs, or which are important fish producer or conservation streams for species Identified in STEP 1).

In the original draft, watershed units were reviewed with Ministry of Environment, Lands and Parks Fish, Wildlife, and Habitat Protection branch staff to identify which watersheds contained species/stocks/runs or were important producers or conservation streams for the species identified in step1. Department of Fisheries and Oceans staff were solicited for input but due to workload and timing concerns were not available to provide detailed comments on this stage of the benchmark. However, reference was made to the Salmon Watershed Planning Profiles for the Fraser River Basin developed by the Department of Fisheries and Oceans staff for planning exercises such as this.

White sturgeon resides in the mainstem portions of large river systems such as the Fraser, Nechako, Bowron, McGregor, and Stuart Rivers as well, they reside or utilize portions of some major tributaries to these large rivers (i.e. Lower Torpy R). Where white sturgeon reside in these major tributaries, the fish species was used to reach the regional priority for fish value. Where the white sturgeon was found in the mainstem portions of these large rivers (i.e. Fraser R, Nechako R, etc) the species was not used to determine the regional priority for fish values. This was to prevent elevated regional priorities from the presence of white sturgeon in large rivers that are associated with many different fish units.

5.3.4 STEP 4: IDENTIFY COMMUNITY WATERSHEDS AND WATERSHEDS WITH SIGNIFICANT (>15 LICENSES) DOMESTIC WATER USE

Once Step 2 was completed, meetings were scheduled with Ministry of Environment Lands and Parks Water Management Branch staff to identify domestic water supply and Forest Practices Code (FPC) designated community watersheds.

Priority for domestic water supply was assigned to all 340 watersheds in the Prince George Forest Region. FPC community watersheds were listed as Very High Priority, as were watersheds with more than 25 domestic water supply licenses. Watersheds with 15 to 25 domestic water supply licenses were identified as High Priority, 5 to 14 as medium and less than 5 as low priority. The format for domestic water supply ranking and prioritization did not change in the 2000 revision.

The regional breakdown of domestic water supply priorities in the 1999 draft were as follows:

5	Very High
2	High Priority
33	Medium
299	Low

and, the regional breakdown of domestic water supply priorities in the 2000 revision is as follows:

6	Very High
3	High Priority
33	Medium
299	Low

The low numbers of domestic water supply priorities in the Prince George Forest Region is due to the lack of FPC community watersheds compared with other regions and the their numbers of subterranean domestic water supplies.

5.3.5 STEP 5: RANK WATERSHEDS IDENTIFIED IN STEP 3 FOR VALUES TO THE FISH RESOURCE, OR FOR SPECIES IDENTIFIED IN STEP 1

All 340 watersheds in the Prince George Forest Region were ranked according to their importance for the identified fish species from Step 1. The recommended procedure for ranking watersheds was as follows:

> **Very High priority** watersheds contain two or more endangered, threatened, or unique species or stocks, or contain two or more high value stocks or targeted species with conservation concerns.
>
> **High priority** watersheds contain one endangered, threatened or unique species or stock or stocks with a conservation concern.
>
> **Medium priority** watersheds contain all other fish bearing watersheds
>
> **Low priority** watersheds are non-fish bearing.

For the 1999 draft, decisions as to where species or stocks were found, or the importance of a given watershed to the viability of a species stock or run was carried out in conjunction with Ministry of Environment Lands and Parks Fish, Wildlife, and Habitat Protection Staff. Department of Fisheries and Oceans Staff of were solicited for comment but due to work load and timing issues were not available for detailed comment of the outcome of this stage of the benchmark. However, reference was made to the publications "Department of Fisheries and Oceans Salmon Watershed Planning Profiles", which were developed to aid in plan development such as this RMP.

At the regional level in the 1999 draft, watersheds were categorized as follows:

85	Very High priority
146	High priority
109	Medium priority
0	Low priority
340	Total

and, at the regional level in the 2000 revision, watersheds were categorized as follows:

98	Very High priority
135	High priority
95	Medium priority
12	Low priority
340	Total

Appendix II of the Resource Planning Framework document stipulates that no more than 25% of watersheds should be ranked as the highest category. The number of high priorities identified in for fish values in the1999 draft is exactly 25 % (340 X 25% = 85 watersheds).

In the 2000 revision the number rose from 25% to 29% (98 watersheds) as a result of new information outlined in the consultation meetings.

5.3.6 STEP 6: ESTIMATE THE IMPACT STATUS AND POTENTIAL FOR RESTORATION OF EACH OF THE RANKED WATERSHEDS

Following the completion of Steps 4 and 5, all watersheds in the Prince George Forest Region were identified in 1 of 5 categories based on their history of resource development. The following summarises the 6 categories :

Category 1: watersheds have known impacts from pre-FPC forestry that will potentially benefit from restoration activities.

Category 2: watersheds have impacts from pre-Code forestry as well as other land uses (including private land) and where there is a co-ordinated restoration plan in place.

Category 2B: watersheds with significant impacts from other land use (including private lands) but where there is no co-ordinated restoration plan in place.

Category 3: watersheds have minimal or no pre-FPC forestry or other impacts.

Category 4: watersheds have been affected to such a degree by pre-FPC forestry that restoration effort is unlikely to be successful.

Category 5: watersheds have insufficient information to determine their status of impact.

Watersheds, in both the 1999 draft and the 2000 revision, were assigned categories based on consultation with Ministry of Forests district watershed restoration technicians, Ministry of Environment Lands and Parks, and Ministry of Forests staff.

5.4 RECOMMENDATIONS OF CRITICAL WATERSHEDS FOR RESTORATION BY 2005

The strategic target identified by Forest Renewal B.C. for the EEV's WRP component is to restore 20% of the Very High priority or critical watersheds for fish or domestic water supply values by 2005. As 98 watersheds were identified as being Very High Priority for fish or domestic water supply values, 20% of these equates to a total of 21 watersheds being recommended for restoration by 2005.

From the 340 watersheds in the Prince George Forest Region, 98 were found to be critical for fish species or domestic water supply. Of those, 31 are identified as being category 1 watersheds (watersheds having known impacts from pre-FPC forestry that will potentially benefit from restoration activities). It was stated in the 1999 draft that there was a 4% buffer in the number of watersheds above the 20% target of 17 and that this 'buffer' would allow room for movement in this year's revision. The number of watersheds from last year remained the same at 21. This number is just over 21% of those considered to be the highest priority, however, the number of 98 that was used to obtain the 21 watersheds is 4% higher than that recommended by FRBC. This 4% higher number (4% > than the recommended 25% of the highest priority watersheds) is unavoidable as the watersheds are ranked in a consistent manner through the regional benchmark approach.

Table 5.3 and Map 5.2 summarize the 21 watersheds recommended for restoration by 2005 to meet Forest Renewal B.C.'s strategic target and Table 5.4 provides a breakdown of each watershed within the region.

Estimating the cost of restoring all of the Target watersheds by the targeted date, is a difficult and time-consuming task. Time would not allow the accurate compilation of costs for the Target watersheds proposed in this plan. Broad estimates were based on the 1999 draft estimates, the deduction of monies for watersheds that were dropped from the Target watershed list, and the estimation of newly added watersheds by comparing them to watersheds of equal or approximate size.

An estimated $21,760,000 will be required by 2005 to complete restoration in all 21 critical watersheds. If there is a difference in the funding required over the 5 year time frame versus the amount of funding available will have to be addressed through either, increasing the annual investment in WRP, decreasing the percentage of watersheds to be restored by 2005, or increasing the time frame for completing restoration to some point beyond 2005.

In the 1999 draft, the Vanderhoof Forest District had four (4) watersheds that were identified as Transition because of the extensive investment in those watersheds. No Priority Key (Target) watersheds were identified in the 1999 draft, and while additional information regarding fish species and regional categorization was received and reviewed, the Vanderhoof Forest District was not considered a priority area within the region. Until such time as the current Priority Key watersheds are completed and some lesser priority watersheds can be restored, the Vanderhoof Forest District will not be a part of the Watershed Restoration Program in the Omineca-Peace Region.

Table 5.3 Key Watersheds Recommended for Restoration by 2005

	MOF District	Watershed (Fish) Unit	Fish Species (Y/N)	Regional Priority for Fish (VH, H, M, L)	Regional Priority for Domestic Water Supply (VH, H, M, L)	Regional Category (1-5)	MYA Number (for W's with active projects)	Name(s) of implementing partners	Estimated Cost of Restoration ($)	Priority Key Watershed (Y/N)
1	Robson Valley	Camp Creek	Y (BT, yellow fin RB)	VH	L	1	OPM98304	n/a	n/a	N
12	Robson Valley	Holmes	Y (BT, CH)	VH	L	1	OPM98304	n/a	800,000	Y
18	Robson Valley	McBride / Dunster	Y (BT, CH)	H	VH	1	OPM98304	n/a	600,000	Y
25	Robson Valley	Trench (South)	Y (BT, CH)	H	VH	1	OPM98304	n/a	n/a	N
38	Vanderhoof	Nithi	Y (stellako RB, SK, CH, BB, KO)	VH	M	1	OPM98408	n/a	n/a	N
48	Fort St James	Chuchi	Y (GR, LT, RB unique)	VH	L	1	OPM98504	n/a	1,100,000	Y
94	Prince George	Bowron	Y (BT, SK, CH, WSG)	VH	L	1	OPM01103	n/a	3,750,000	Y
130	Prince George	Table	Y (GR, BT)	VH	L	1	OPM98111	n/a	650,000	Y
131	Prince George	Torpy (lower)	Y (BT, CH, WSG)	VH	L	1	OPM01103	n/a	850,000	Y
132	Prince George	Torpy (upper)	Y (BT, LT, CH, WSG)	VH	L	1	OPM01103	n/a	1,050,000	Y
135	Prince George	Willow	Y (BT, LT, KO, Eaglet Lk sustenance, CH)	VH	L	1	OPM01103 OPM98105	n/a	3,125,000	Y
141	Mackenzie	Davis	Y (BT, GR)	VH	L	1	OPM98604	n/a	n/a	N
160	Mackenzie	Mesilinka (lower)	Y (BT, GR)	VH	L	1	OPM01603	n/a	1,025,000	Y
162	Mackenzie	Misinchinka	Y (BT, GR)	VH	L	1	OPM01603	n/a	450,000	Y
164	Mackenzie	Nation	Y (BT, GR)	VH	L	1	OPM98604	n/a	600,000	Y
167	Mackenzie	Osilinka (lower)	Y (BT, GR, LT)	VH	L	1	OPM01603	n/a	950,000	Y
174	Mackenzie	Philip	Y (BT, GR, KO)	VH	L	1	OPM98604	n/a	n/a	N
175	Mackenzie	Russell	Y (BT, GR)	VH	L	1	OPM98604	n/a	750,000	Y
194	Fort St John	Black Creek/Nig Creek	Y (GR)	VH	L	1	OPM01803	n/a	550,000	Y
200	Fort St John	Colt Creek	Y (BT, GR, RB)	VH	M	1	OPM01803	n/a	415,000	Y

214	Fort St John	Kobes Creek/Groundbirch Cr.	Y (BT, GR, RB)	VH	M	1	OPM01803	n/a	650,000	Y
238	Dawson Creek	Burnt River	Y (BT, GR, RB)	VH	L	1	n/a	n/a	n/a	N
243	Dawson Creek	Gething	Y (BT, GR, RB)	VH	L	1	OPM01703	n/a	900,000	Y
244	Dawson Creek	Gwillam	Y (BT, GR, RB)	VH	L	1	n/a	n/a	n/a	N
245	Dawson Creek	Hasler	Y (BT, GR, RB)	VH	M	1	n/a	n/a	700,000	Y
246	Dawson Creek	Imperial	Y (BT)	VH	L	1	n/a	n/a	n/a	N
258	Dawson Creek	Pine Pass	Y (BT, GR, RB)	VH	M	1	OPM98705	n/a	750,000	Y
265	Dawson Creek	Upper Sukunka	Y (BT, RB, GR)	VH	L	1	OPM98705	n/a	750,000	Y
268	Dawson Creek	Wolverine	Y (BT, GR)	VH	L	1	OPM01703	n/a	1,350,000	Y
270	Fort Nelson	Big Beaver	Y (BT, GR)	VH	L	1	n/a	n/a	n/a	N
301	Fort Nelson	Kledo	Y (BT, GR)	VH	L	1	n/a	n/a	n/a	N

Table 5.4 Regional Watershed Unit Breakdown

WU Breakdown		(#)
All watershed units with some pre-code forest harvesting (Category 1, 2, 4)		109
# of watershed units which are important for domestic water supply (VH, H)		10
Number of key watersheds (i.e. VH, H, values for fish/water values)		233
	Category I key watersheds	104
	Category II key watersheds	4
	Category IIB key watersheds	41
	Category III key watersheds	157
	Category IV key watersheds	1
	Category V key watersheds	33
Number of priority key watersheds		21

5.5 TRANSITION FUNDING

Through the shifting focus of Forest Renewal's EEV objectives, a number of non-critical watersheds the have received WRP investment in the past will not be recommended for further investment beyond the 1999-2000 fiscal year. To ensure that investment to date in restoration prescriptions or works was not lost, Forest Renewal B.C. funded projects initiated in non-critical watersheds for the fiscal year 2000-2001. These projects had evidence of substantial investment to date in the watershed and they were to be completed in the 2000-2001 fiscal year.

Transition funding is considered complete throughout the region and those watersheds that did not receive transition funding attention are assumed to have been insignificant projects for this funding, or they were near completion and not dealt with. Proponents in each of the districts were aware of the transition funding criteria and were to have implemented works in the 2000-2001 fiscal year. Those that did not are also aware that the opportunity to conduct works in these watersheds in the remaining years of the plan is no longer available. FRBC has identified the need to apply final adjustments to the projects funded under transition monies and, as a result, will fund "hotspot" projects where the need arises. This funding allocation should conclude the Transition phase of the EEV component of the RMP.

5.6 CATEGORY 5 WATERSHEDS

The formulation of the regional benchmark indicated watershed units within the Prince George Forest Region where there is insufficient information available to make a priority determination. The information gaps are due to either lack of fish inventory or pre-FPC harvesting information. These watersheds have been identified as Category 5 watersheds and are summarised in Table 5.5. In total there are 33 category 5 watersheds in the Prince George Forest Region. As the fish values and potential for restoration in these watersheds are unknown, broad overview assessments should be undertaken in them in the near future. This will allow these 33 watersheds to be properly integrated into the regional benchmark. Re-classifying these watersheds may have implications on the 20 critical watersheds presently being recommended for restoration by 2005.

Table 5.5 Regional Category 5 Watersheds

#	MOF District	Watershed (Fish) Unit	Fish Species (Y/N)	Regional Priority for Fish (VH, H, M, L)	Regional Priority for Domestic Water Supply (VH, H, M, L)	Regional Category (1-5)	MYA Number (for W's with active projects)	Name(s) of implementing partners	Transition watershed (Y/N)	Key Watershed (Y/N)	Priority Key Watershed (Y/N)
42	Vanderhoof	Sutherland	Y (unique RB, SK, KO)	VH	L	5	OPM98408	n/a	N	N	N
49	Fort St James	Cunningham	Y (BT, SK, LT)	H	L	5	n/a	n/a	N	N	N
63	Fort St James	Middle A	Y (KO, BT, DV, SK, CH)	VH	L	5	OPM01505 OPM98504	n/a	N	N	N
64	Fort St James	Middle B	Y (KO, BT, LT, DV, SK, CH)	VH	L	5	OPM01505 OPM98504	n/a	N	N	N
70	Fort St James	Sakenichie	Y (BT, KO, SK)	H	L	5	OPM01505	n/a	N	N	N
81	Fort St James	Tachie River	Y (unique RB, SK, CH)	VH	L	5	OPM00510	n/a	N	N	N
88	Fort St James	Whitefish	Y (RB, LT)	M	L	5	OPM98508	n/a	N	N	N
89	Prince George	Anzac	Y (BT, GR)	VH	L	5	OPM01103	n/a	N	N	N
93	Prince George	Blackwater	Y (RB, CH)	H	L	5	OPM01103	n/a	N	N	N
96	Prince George	Carp	Y (RB McLeod R., BT)	H	L	5	OPM98105 OPM01103	n/a	N	N	N
107	Prince George	Hominka	Y (GR, BT)	VH	L	5	OPM98111	n/a	N	N	N
115	Prince George	Missinka	Y (GR, BT)	VH	L	5	OPM98111	n/a	N	N	N
121	Prince George	Parsnip (lower)	Y (BT, GR, LT)	H	L	5	OPM98111	n/a	N	N	N
122	Prince George	Parsnip (upper)	Y (BT)	H	L	5	OPM98111	n/a	N	N	N
123	Prince George	Reynolds	Y (GR)	H	L	5	OPM98111	n/a	N	N	N
129	Prince George	Stuart	Y (CH, SK, BT, WSG)	H	L	5	OPM01103	n/a	N	N	N
150	Mackenzie	Germansen	Y (GR, BT)	H	L	5	OPM98604	n/a	N	N	N

154	Mackenzie	Klawli	Y (LT, BT)	M	L	5	OPM98604	n/a	N	N	N
205	Fort St John	Farrell Creek	Y (GR, RB)	H	M	5	n/a	n/a	N	N	N
210	Fort St John	Horseshoe/Bluegrave	Y (BT, GR, RB)	VH	M	5	n/a	n/a	Y	N	N
239	Dawson Creek	Carbon	Y (BT, GR, RB)	VH	L	5	OPM01703 OPM98705	n/a	N	N	N
247	Dawson Creek	Johnson Creek	Y (BT, GR, RB)	VH	M	5	n/a	n/a	N	N	N
264	Dawson Creek	Upper Moberly	Y (BT, GR, RB)	VH	H	5	OPM98705	n/a	N	N	N
272	Fort Nelson	Capot Blanc	Y (GR)	H	L	5	n/a	n/a	N	N	N
273	Fort Nelson	Catkin	N	M	L	5	n/a	n/a	N	N	N
283	Fort Nelson	Etane	N	M	L	5	n/a	n/a	N	N	N
294	Fort Nelson	Hoffard	N	M	L	5	n/a	n/a	N	N	N
300	Fort Nelson	Kiwigana	N	M	L	5	n/a	n/a	N	N	N
305	Fort Nelson	Kyklo	N	M	L	5	n/a	n/a	N	N	N
306	Fort Nelson	Labiche	N	M	L	5	n/a	n/a	N	N	N
320	Fort Nelson	Patry	N	M	L	5	n/a	n/a	N	N	N
328	Fort Nelson	Sahtaneh	N	M	L	5	n/a	n/a	N	N	N
331	Fort Nelson	Shekilie	N	M	L	5	n/a	n/a	N	N	N

5.7 EFFECTIVENESS EVALUATIONS

In an effort to identify priority needs for research and intensive effectiveness evaluation and operational technique refinement, the EEV committee solicited input from industry stakeholders. They were asked to provide their thoughts and comments regarding the need for monitoring the effectiveness of their EEV projects and their opinions of how this type of work should be funded. Most of the stakeholders agree that effectiveness evaluations are important components of the entire project but none had any recommendations of how, and to what intensity, the monitoring/evaluations should be carried out. They, in turn, are seeking the answers to this question from the representative Ministries.

The Committee recognizes the absolute importance of evaluating restoration works to ensure that the current techniques and implementation practices are effective in meeting the outlined objectives. Without some type of monitoring/evaluations of the completed projects (it is arguable that the project is not complete without some level of monitoring) it is not possible to define a project as complete and/or successful. The Committee is of the opinion that the development of an effectiveness evaluation framework is required before the EEV component of the RMP can be considered a holistic plan, but the time and effort it will take to accurately determine the needs and develop such a framework is currently unavailable. Also, before such an endeavor is attempted, input from the stakeholders is essential. No submissions regarding this component of the Plan were received from the stakeholders by the September 5th submission deadline.

5.8 STAKEHOLDER CONSULTATION

Direction for the revision of the EEV was obtained from the document 'Guidelines For The Enhancing Environmental Values Component' (May 5th, 2000) of the RMP. In efforts to revise the 1999 draft of the EEV component of the RMP, district meetings were held with the proponents and interested parties. A formal letter was sent to each of the WRP technicians in each of the MoF district offices requesting the organisation of a meeting on a specified date with all interested parties and vested interest groups. Identifying and contacting the proponents, stewardship groups, First Nations, interest groups, MoF and MoELP representatives, etc was the responsibility of the district WRP technicians. The intent of the meeting was to present the 1999 draft of the RMP and to solicit any additional, contrary, or otherwise pertinent information that would be useful in revising the plan. Tables 3a and 3b (as outlined in Section 6.0 of the aforementioned document) were outlined as the format for the revised RMP and a completed table 3b was requested from each of the districts (see Appendix 5..

A date of September 5th, 2000 was given as the deadline for submission of any additional, contrary, or otherwise pertinent information. Meeting details that include; attendance lists, dates, times, and issues were kept and are presented in Appendix 11.5.1.

5.9 LIMITATIONS AND ISSUES OF CONCERN

As the Prince George Forest Region EEV RMP has been revised, a number of issues were raised by government and forest industry stakeholders both in 1999 and in 2000 for this revision. Limitations and issues of concern of the EEV component of this RMP, as presented by the forest industry stakeholders and the Government Steering Committee members, are summarised as follows:

5.9.1 WATERSHED PRIORITIES

The new delivery model of the Watershed Restoration Program directs restoration activities into established 'Target' watersheds. This format is driven by the presence of specified fish species and/or the presence of community water supply. Many concerns were raised during the consultation process for this review in regards to this format. Most felt that using fish as the primary tool to identify priority watersheds is biased and ignores some fundamental environmental issues or concerns that may be unique to a particular watershed. As a result of this format some forest districts, and some areas within forest districts, may not receive funding for watershed restoration. This is both a social and economic concern echoed by a significant proportion of the industry stakeholders.

5.9.2 ANNUAL FUNDING

Annual funding for restoration works in non-priority watersheds was another issue raised to the EEV RMP steering committee. There are currently licensee, district and even regional scale projects that have been funded by Forest Renewal B.C. over the previous years that identify 'hot-spot' areas to undertake watershed restoration works. These 'hot spots' are comprised mainly of stream crossings (typically culverts) that block fish passage, and road failures or landslide attributable to pre-FPC forest harvesting activity. In previous years, eligible projects have been funded by Forest Renewal B.C. on an annual basis regardless of location.

With the current delivery model of WRP these projects may be funded on a case-by-case basis and if they satisfy the list of requirements as stated under Section B4 of Attachment B of the EEV Guidelines (May, 2000) which includes a provision that they must be within a Targeted watershed. Previous work has shown that up to 80% of culverts on fish bearing streams are barriers to fish passage in the Omineca-Peace and Cariboo Regions, with thousands of kilometers of fish habitat isolated upstream of them. In some districts, re-establishing fish passage is the highest priority restoration work to be completed.

While some of these areas of concern may be addressed through road deactivation, efforts should be made to directly manage these issues. Target/Key watershed management effectively eliminates the possibility of restoring fish access or mitigating environmental impacts from sediment delivery generated by road and hillslope failures that are a direct result of pre-Code harvest activities.

The EEV RMP steering committee strongly recommends that Forest Renewal B.C. develop a strategy to identify and fund issues such as stream crossing and road failure projects in non-critical watersheds on an annual basis. Forest Renewal funds expensive habitat creation and channel stabilization within small scale selected areas, while thousands of kilometers of natural habitat is inaccessible from point source blockages. It is believed that this management effort is the most efficient and cost effective manner of restoring un-used and valuable fish habitat while meeting the restoration targets of FRBC.

5.9.3 DOMESTIC WATER SUPPLY

The presence of a Very High domestic water supply, associated with a community supply/source or permitted water users, may elevate the regional priority of that watershed to that of Key or Priority Key. Stakeholders in the Vanderhoof district would like to see more value associated to single, non-permitted water users. These are not normally associated with community supplies, but deal more with single dwellings situated downstream of pre-code impacted headwaters. Realizing the difficulty associated with accommodating each of this type of water user in restoration resource management, it is recommended that attempts should be made to identify these water users and their relationship to the impacts of pre-Code harvest in each of the Target watersheds.

5.9.4 VANDERHOOF PRIORITY WATERSHEDS

As mentioned in the section: Recommendations of Critical Watersheds For Restoration by 2005, the Vanderhoof district will not receive any Priority Key watersheds for restoration in this submission of the RMP. Aside from any 'hotspot' funding to complete or compliment the works completed under Transition funding in 2000, there is no future watershed restoration activities planned within the Vanderhoof Forest District. This decision was made based on the results of the Regional Benchmark used to determine priority watersheds and did not include any regional considerations of whether the Program will continue in a certain area. It did not consider any regional considerations because the current format for determining priority watersheds does not allow for such considerations. This issue has been actively voiced by the district MoF office and by stakeholders for some time. They are concerned that if no priority watersheds are identified in this revision of the Plan, then the program will terminate in their area. This is exactly what has transpired in the Vanderhoof district, and which will undoubtedly have a social and economic impact in the communities with the Vanderhoof district.

5.10 RECOMMENDATIONS

5.10.1 FISH PASSAGE

As discussed in #2 of the previous section, numerous culverts that are impassable to fish are found over the majority of each forest district. Under the new delivery model of the EEV component, these problem areas cannot be addressed unless they happen to be within a Target watershed. It is recommended that funding be made available to specifically address these areas of concern on a district wide level. To fund the restoration of impassable fish culverts outside of Target watersheds with 'hotspot' funding under-estimates the size and importance of this problem. Hotspot funding should be reserved for final adjustments to Transition watershed projects and for unforeseen situations that negatively impact the environment (i.e. slope failures affecting water quality and/or fish habitat). It is anticipated that the identification, assessment, and restoration of those culverts with the highest priorities could be completed in a few years, and therefore, the annual funding required to address this problem would not have to be long term. The monies spent on this type of restoration would provide the greatest efficiency and benefit per cost because natural unused habitat is being reclaimed.

5.10.2 CATEGORY 5 WATERSHEDS

Of the 340 watersheds in the Omineca-Peace region, 33 are listed as Category 5. For this Plan to be effective at identifying all of the Key watersheds, the status of these category 5 watersheds must be known. It is recommended that annual funding be made available to assess the Category 5 watersheds and re-categorise them appropriately. Until the correct status of these watersheds is known, they cannot be eliminated for the possibility of becoming Key watersheds.

5.10.3 LOCALLY IMPORTANT WATERSHEDS

Although there is a Regional Benchmark system in place to identify and priorise Key watersheds, there should be some means of identifying those watersheds that are important to each district where no Key watersheds have been identified. To date, only the Vanderhoof district is about to experience the socio-economic implications of the Program ceasing in that area, however, the potential exists for other districts to be eliminated from the Program as a result of the current delivery model. Understanding that the program is fish species and, to a lesser extent, domestic water supply driven, there should be some continuation of the Program in districts where no Key watersheds are identified.

5.10.4 PLANNING LOGISTICS

It was recommended in the 1999 draft that the time of year that this RMP is compiled falls at the busiest time of the field season and at a time when many of the committee members and stakeholders are enjoying annual leave. This timing is of issue because it limits the extent to which the data can be compiled and effectively reviewed, as well, the opportunity for stakeholders to provide input is reduced. A submission date later in the fall of the year or sometime in the early winter would allow the Committee to effectively collect and review the data resulting in an accurate and complete EEV submission to the RMP.

6 NON-STATUS ROAD DEACTIVATION AND REHABILITATION

6.1 REGIONAL SUMMARY OF DEACTIVATION AND REHABILITATION ISSUES AND PRIORITIES RELATING TO NON-STATUS ROADS

6.1.1 PROCESS FOR COMPILING THE DATA

The data in this component of the Resource Management Plan (RMP) consists of projects and cost estimates for activities on non-status roads that are considered non-eligible for FRBC funding. The guidelines for this component (dated February 9, 2000) were distributed to the Forest Districts in early May. Round table meetings were then held in each District office where both Licensee and Ministry of Forests Engineering staff were invited. District FRBC co-ordinators were also invited as the round table meetings also covered the Enhancing Environmental Values (EEV) component. District meetings were held on the following dates:

Table 6.1 Non-Status Road Collaboration Meetings.

Forest District	Meeting Date
Prince George	July 11, 2000
Robson Valley	July 14
Vanderhoof	July 25
Fort St. James	July 13
Mackenzie	July 18
Fort St. John/Fort Nelson	July 19

Tim Silbernagel chaired each District meeting. The component guidelines, eligibility criteria and data format were discussed at each meeting. Districts were instructed to submit the data to Region by September 5, 2000. An attendance list was completed for each meeting. Tim Silbernagel screened and compiled the local data for inclusion in the Prince George Regional Resource Management Plan (RMP). No one attended on behalf of Ft. Nelson District no local data was submitted.

6.1.2 RESULTS OF DATA COMPILATION

District data submissions identified projects totalling **$5,484,653.00**

This figure is comprised of the following:

- $3,445,500.00 of *High* priority activities;

- $922,000.00 of *Moderate* priority activities and;
- $1,117,153.00 of *Low* priority activities

6.2 MANAGEMENT UNIT ISSUES AND PRIORITIES

No management unit issues were reported as a result of the district program meetings, however concerns have been raised concerning the investment focus of Forest Renewal.

Annual funding for restoration works in non-priority watersheds was presented as an issue by the EEV RMP steering committee. There are currently licensee, district and even regional scale projects that have been funded by Forest Renewal B.C. over the previous years that identify 'hot-spot' areas to undertake watershed restoration works. These 'hot spots' are comprised mainly of stream crossings (typically culverts) that block fish passage, and road failures or landslide attributable to pre-FPC forest harvesting activity. In previous years, eligible projects have been funded by Forest Renewal B.C. on an annual basis regardless of location.

With the current delivery model of WRP these projects may be funded on a case-by-case basis and if they satisfy the list of requirements as stated under Section B4 of Attachment B of the EEV Guidelines (May, 2000) which includes a provision that they must be within a Targeted watershed. Previous work has shown that up to 80% of culverts on fish bearing streams are barriers to fish passage in the Omineca-Peace and Cariboo Regions, with thousands of kilometers of fish habitat isolated upstream of them. In some districts, re-establishing fish passage is the highest priority restoration work to be completed.

While some of these areas of concern may be addressed through the Non-Status Road Deactivation and Rehabilitation Program, efforts should be made to directly manage these issues. Target/Key watershed management effectively eliminates the possibility of restoring fish access or mitigating environmental impacts from sediment delivery generated by road and hillslope failures that are a direct result of pre-Code harvest activities.

The EEV RMP steering committee strongly recommends that Forest Renewal B.C. develop a strategy to identify and fund issues such as stream crossing and road failure projects in non-critical watersheds on an annual basis. Forest Renewal funds expensive habitat creation and channel stabilization within small scale selected areas, while thousands of kilometers of natural habitat is inaccessible from point source blockages. It is believed that this management effort is the most efficient and cost effective manner of restoring un-used and valuable fish habitat while meeting the restoration targets of FRBC.

Regional targetted watersheds and key investment projects are presented Table 6.2, by management unit and priority.

Table 6.2 Non-status Road Deactivation and Rehabilitation Project Summary

Region	District	RMP Watershed Number	Watershed Name	Project Name	Proponent	Activity	Units	Estimated Cost	Priority (H,M,L)	Benefit to	Comment
PG	PG	89	Anzac	Prescriptions and works	MoF	DA/RD	n/a	50,000	H	landbase stability	
PG	PG	90	Averil	Prescriptions and works	MoF	DA/RD	n/a	175,000	H	landbase stability	
PG	PG	91	Bastille	Prescriptions and works	MoF	DA/RD	n/a	35,000	M	landbase stability	
PG	PG	92	Beaverly	IWAP	MoF	DA	1	50,000	M	WRP Planning	
PG	PG	93	Blackwater	IWAP	MoF	DA	1	75,000	M	WRP Planning	
PG	PG	94	Bowron (Tumuch)	IWAP	Canfor	DA	1	30,000	H	WRP Planning	
PG	PG	95	Captain	IWRP	MoF	DA	1	20,000	H	WRP Planning	
PG	PG	96	Carp	IWAP	MoF	DA	1	100,000	L	WRP Planning	
PG	PG	97	Cottonwood	IWAP	MoF	DA	1	50,000	M	WRP Planning	
PG	PG	98	Crooked	IWAP	MoF	DA	1	50,000	H	WRP Planning	
PG	PG	99	Dome	Effectiveness Monitoring	MoF	EE	1	20,000	M	Technique Refinement	
PG	PG	100	Fontinako	IWRP	MoF	DA	1	20,000	H	WRP Planning	
PG	PG	101	Framstead	IWRP	MoF	DA	1	20,000	H	WRP Planning	
PG	PG	102	Fraser (lower)	IWAP	MoF	DA	1	200,000	L	WRP Planning	
PG	PG	102	Fraser (low) (Baldy /Stone)	Prescriptions and works	MoF	DA/RD	n/a	300,000	H	landbase stability	
PG	PG	103	Fraser (upper)	IWAP	MoF	DA	1	200,000	L	WRP Planning	
PG	PG	104	Gregg	IWAP & prescriptions	MoF	DA	1	50,000	M	WRP Planning	
PG	PG	105	Haggen	IWAP & prescriptions	MoF	DA	1	200,000	H	WRP Planning	
PG	PG	106	Hixon	Effectiveness Monitoring	MoF	EE	1	20,000	H	Technique Refinement	
PG	PG	107	Hominka	Prescriptions and works	MoF	DA/RD	n/a	65,000	H	landbase stability	
PG	PG	108	Humbug	IWAP	MoF	DA	1	30,000	H	WRP Planning	
PG	PG	109	James	IWRP	MoF	DA	1	20,000	H	WRP Planning	

PG	PG	110	Kenneth	Effectiveness Monitoring	MoF	EE	1	20,000	H	Technique Refinement	
PG	PG	110	Kenneth (Hungary)	IWAP	MoF	DA	1	20,000	H	WRP Planning	
PG	PG	111	Kitchi	Prescriptions and works	MoF	DA/RD	n/a	40,000	H	landbase stability	
PG	PG	112	McGregor (lower)	IWRP	MoF	DA	1	100,000	M	WRP Planning	
PG	PG	113	McGregor (upp) Jarvis	Prescriptions and works	MoF	DA/RD	n/a	40,000	H	landbase stability	
PG	PG	113	McGregor (upp) McCullagh	Prescriptions and works	MoF	DA/RD	n/a	35,000	H	landbase stability	
PG	PG	115	Missinka	Prescriptions and works	MoF	DA/RD	n/a	100,000	H	landbase stability	
PG	PG	116	Mud (upper)	Effectiveness Monitoring	MoF	EE	1	20,000	M	Technique Refinement	
PG	PG	117	Muskeg	IWAP	MoF	DA	1	50,000	H	WRP Planning	
PG	PG	118	Naver	Effectiveness Monitoring	MoF	EE	1	20,000	H	Technique Refinement	
PG	PG	119	Nechako	IWAP	MoF	DA	1	250,000	M	WRP Planning	
PG	PG	120	Ovington	IWRP	MoF	DA	1	20,000	H	WRP Planning	
PG	PG	121	Parsnip (lower)	IWAP	MoF	DA	1	50,000	M	WRP Planning	
PG	PG	121	Parsnip (low) (Chuchinka)	IWAP	MoF	DA	1	30,000	M	WRP Planning	
PG	PG	122	Parsnip (upper)	IWAP	MoF	DA	1	50,000	H	WRP Planning	
PG	PG	123	Reynolds	IWAP	MoF	DA	1	30,000	H	WRP Planning	
PG	PG	123	Reynolds (Chudnuslida)	IWAP	MoF	DA	1	50,000	H	WRP Planning	
PG	PG	124	Salmon	IWAP	MoF	DA	1	50,000	L	WRP Planning	
PG	PG	125	Seebach	Prescriptions and works	MoF	DA/RD	n/a	100,000	H	landbase stability	
PG	PG	126	Slender	Effectiveness Monitoring	MoF	EE	1	20,000	L	Technique Refinement	
PG	PG	127	Slim	IWAP	MoF	DA	1	30,000	M	WRP Planning	
PG	PG	128	Spakwaniko	IWRP	MoF	DA	1	20,000	H	WRP Planning	
PG	PG	129	Stuart	IWAP	MoF	DA	1	30,000	L	WRP Planning	
PG	PG	130	Table	Prescriptions and works	MoF	DA/RD	n/a	50,000	H	landbase stability	
PG	PG	131	Torpy (lower)	Effectiveness Monitoring	MoF	EE	1	20,000	H	Technique Refinement	
PG	PG	132	Torpy (upper)	Effectiveness Monitoring	MoF	EE	1	20,000	H	Technique Refinement	
PG	PG	133	Weedon	IWAP	MoF	DA	1		L	WRP Planning	

								30,000			
PG	PG	134	Wicheeda	IWAP	MoF	DA	1	30,000	H	WRP Planning	
PG	PG	135	Willow (Tsus)	Effectiveness Monitoring	Carrier	EE	1	20,000	H	Technique Refinement	
PG	PG	n/a	Miscellaneous	Non-Status washouts	MoF	RR	n/a	100,000	H	DM liability	
PG	PG	n/a	Miscellaneous	Assessing old mill sites	MoF	DA	n/a	50,000	H	WRP Planning	
PG	RV	11, 19 & 24	Goat, Milk, North Trench	Road Deactivation	MoF or MFI	RD	151km	80,000	H	Mature & planted forest	
PG	RV	11, 19 & 24	Goat, Milk, North Trench	Road Deactivation	MoF or MFI	RD	151km	750,000	H	Mature & planted forest	
PG	RV	24	Crescent Spur	Catfish	MoF	RD	2km	70,000	H	Mature & planted forest	
PG	RV	12	Holmes	Nevin	MoF	RD	12km	50,000	M	Mature & planted forest	
PG	RV	8	East Twin / McKale	Minnow	MoF	RD	2km	42,500	H	fish stream	
PG	VA	42	Sutherland (Willington)	Bridge deactivation	MoF	RD	1	12,000	H	DM liability	
PG	VA	42	Sutherland (Shovel)	Bridge deactivation	MoF	RD	1	10,000	H	DM liability	
PG	FSJ	88	Whitefish	Whitefish Road	MoF	RR	site	25,000	H	water quality	reestablish natural drainage & ford construction
PG	FSJ	88	Whitefish	CP Road (Cunningham)	MoF	RR	site	5,000	H	water quality	road deactivation/stream restoration
PG	FSJ	64	Middle B	Ecofor Site 4	Apollo	FAR	site	50,000	H	fish passage	replace culvert w/ arch pipe or bridge
PG	FSJ	64	Middle B	Ecofor Site 231	Apollo	FAR	site	15,000	H	fish passage	replace culvert for fish passage
PG	FSJ	64	Middle B	Ecofor Site 235	Apollo	FAR	site	2,000	H	fish passage	remove debris for fish passage
PG	FSJ	64	Middle B	Ecofor Site 304	Apollo	FAR	site	10,000	H	fish passage	repair or replace culvert for fish passage
PG	FSJ	64	Middle B	Ecofor Site 500	Apollo	FAR	site	10,000	H	fish passage	replace culvert for fish passage
PG	FSJ	64	Middle B	Ecofor Site 7	Apollo	FAR	site	2,000	M	fish passage	beaver dam removal to restore fish passage
PG	FSJ	64	Middle B	Ecofor Site 18	Apollo	FAR	site	10,000	M	fish passage	repair or replace culvert for fish passage
PG	FSJ	64	Middle B	Ecofor Site 88	Apollo	FAR	site	10,000	M	fish passage	replace culvert for fish passage
PG	FSJ	64	Middle B	Ecofor Site 203	Apollo	FAR	site	10,000	M	fish passage	confirm fish presence, address barrier
PG	FSJ	64	Middle B	Ecofor Site 227	Apollo	FAR	site	10,000	M	fish passage	replace culvert w/ arch pipe for fish passage
PG	FSJ	64	Middle B	Ecofor Site 606	Apollo	FAR	site	10,000	M	fish passage	confirm fish presence, address barrier
PG	FSJ	64	Middle B	Ecofor Site 16	Apollo	FAR	site	10,000	L	fish passage	no fish passage at high flows

PG	FSJ	64	Middle B	Ecofor Site 299	Apollo	FAR	site	2,000	L	fish passage	culverts plugged, remove/replace/unplug
PG	FSJ	64	Middle B	Ecofor Site 87	Apollo	RR	site	4,000	L	WRP Planning	sediment source
PG	FSJ	64	Middle B	Ecofor Site 88	Apollo	RR	site	4,000	L	WRP Planning	sediment source
PG	FSJ	64	Middle B	Ecofor Site 208	Apollo	DAS	site	10,000	L	WRP Planning	confirm fish presence, address barrier
PG	FSJ	64	Middle B	Ecofor Site 209	Apollo	DAS	site	10,000	L	WRP Planning	confirm fish presence, address barrier
PG	FSJ	64	Middle B	Ecofor Site 213	Apollo	DAS	site	10,000	L	WRP Planning	confirm fish presence, address barrier
PG	FSJ	64	Middle B	Ecofor Site 216	Apollo	DAS	site	10,000	L	WRP Planning	confirm fish presence, address barrier
PG	FSJ	64	Middle B	Ecofor Site 215	Apollo	RR	site	4,000	L	WRP Planning	sediment source
PG	FSJ	64	Middle B	Ecofor Site 005	Apollo	RR	site	4,000	L	WRP Planning	sediment source
PG	FSJ	64	Middle B	Ecofor Site 29	Apollo	DAS	site	10,000	L	WRP Planning	confirm fish presence, address barrier
PG	FSJ	64	Middle B	Ecofor Site 223	Apollo	DAS	site	10,000	L	WRP Planning	confirm fish presence, address barrier
PG	FSJ	64	Middle B	Ecofor Site 229	Apollo	DAS	site	10,000	L	WRP Planning	confirm fish presence, address barrier
PG	FSJ	64	Middle B	Ecofor Site 300	Apollo	DAS	site	10,000	L	WRP Planning	confirm fish presence, address barrier
PG	FSJ	64	Middle B	Takatoot 16	Canfor	FAR	site	15,000	H	fish passage	fish passage
PG	FSJ	47	Beaver/Salmon	Carrier 5	Canfor	FAR	site	15,000	H	fish passage	fish passage
PG	FSJ	64	Middle B	Takatoot 18	Canfor	FAR	site	15,000	H	fish passage	fish passage
PG	FSJ	71	North Salmon	Ocock 7	Canfor	FAR	site	15,000	H	fish passage	fish passage
PG	FSJ	64	Middle B	Takatoot 19	Canfor	FAR	site	15,000	H	fish passage	fish passage
PG	FSJ	64	Middle B	Takatoot 17	Canfor	FAR	site	15,000	M	fish passage	fish passage
PG	FSJ	83	Tchentlo 27	Purvis 30	Canfor	FAR	site	15,000	M	fish passage	fish passage
PG	FSJ	70	Sakenichie	Macdougal 26	Canfor	FAR	site	15,000	M	fish passage	fish passage
PG	FSJ	71	North Salmon	Harry Lake 3	Canfor	FAR	site	15,000	M	fish passage	fish passage
PG	FSJ	63	Middle A	Baptiste 10	Canfor	FAR	site	15,000	L	fish passage	fish passage
PG	FSJ	64	Middle B	Takatoot 20	Canfor	FAR	site	15,000	L	fish passage	fish passage
PG	FSJ	83	Tchentlo 27	Purvis 29	Canfor	FAR	site	15,000	L	fish passage	fish passage
PG	FSJ	88	Whitefish	Whitefish 1	Canfor	FAR	site	15,000	L	fish passage	fish passage

PG	FSJ	71	North Salmon	Hat 8	Canfor	FAR	site	4,000	H(?)	WRP Planning	sediment source
PG	FSJ	83	Tchentlo 27	Purvis 27	Canfor	FAR	site	15,000	H(?)	WRP Planning	culvert substandard & suspected fish passage problem
PG	FSJ	47	Beaver/Salmon	Carrier 6	Canfor	FAR	site	15,000	H(?)	WRP Planning	culvert substandard & suspected fish passage problem
PG	FSJ	64	Middle B	Elliot 15	Canfor	FAR	site	15,000	H(?)	WRP Planning	culvert substandard & suspected fish passage problem
PG	FSJ	82	Tchentlo 25	Valleau 40	Canfor	FAR	site	15,000	H(?)	WRP Planning	culvert substandard & suspected fish passage problem
PG	FSJ	70	Sakenichie	Sakenichie 23	Canfor	FAR	site	15,000	H(?)	WRP Planning	culvert substandard & suspected fish passage problem
PG	FSJ	70	Sakenichie	Sakenichie 24	Canfor	FAR	site	15,000	H(?)	WRP Planning	culvert substandard & suspected fish passage problem
PG	FSJ	70	Sakenichie	Sakenichie 22	Canfor	FAR	site	15,000	H(?)	WRP Planning	culvert substandard & suspected fish passage problem
PG	FSJ	70	Sakenichie	Macdougal 22	Canfor	FAR	site	15,000	H(?)	WRP Planning	culvert substandard & suspected fish passage problem
PG	FSJ	83	Tchentlo 27	Purvis A2	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	70	Sakenichie	Macdougal A5	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	71	North Salmon	Salmon A1	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	82	Tchentlo 25	Tchentlo A8	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	83	Tchentlo 27	Purvis A7	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	71	North Salmon	Hat A1	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	83	Tchentlo 27	Purvis A4	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	82	Tchentlo 25	Tchentlo A1	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	63	Middle A	Middle A3	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	82	Tchentlo 25	Tchentlo A2	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	64	Middle B	Elliot A2	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	64	Middle B	Takatoot A8	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	63	Middle A	Baptiste A2	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	63	Middle A	Baptiste A8	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	47	Beaver/Salmon	Harry Lake A1	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	63	Middle A	Baptiste A5	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	64	Middle B	Elliot A4	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required

PG	FSJ	47	Beaver/Salmon	Carrier A4	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	64	Middle B	Elliot A3	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	47	Beaver/Salmon	Carrier A2	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	64	Middle B	Takatoot A5	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	63	Middle A	Middle A4	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	71	North Salmon	Ocock A1	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	64	Middle B	Elliot A5	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	70	Sakenichie	Sakenichie A1	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	63	Middle A	Baptiste A3	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	63	Middle A	Middle A7	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	71	North Salmon	Ocock A2	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	63	Middle A	Baptiste A1	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	63	Middle A	Middle A9	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	70	Sakenichie	Sakenichie A4	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	82	Tchentlo 25	Tchentlo A6	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	64	Middle B	Takatoot A6	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	71	North Salmon	Ocock A3	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	63	Middle A	Middle A5	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	47	Beaver/Salmon	Carrier A3	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	64	Middle B	Takatoot A7	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	64	Middle B	Takatoot A1	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	64	Middle B	Elliot A7	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	83	Tchentlo 27	Purvis A1	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	64	Middle B	Takatoot A9	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	70	Sakenichie	MacDougal A3	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	82	Tchentlo 25	Tchentlo A5	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required

PG	FSJ	70	Sakenichie	MacDougal A4	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	83	Tchentlo 27	Purvis A3	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	88	Whitefish	Karena A1	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	82	Tchentlo 25	Tchentlo A3	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	70	Sakenichie	Sakenichie A2	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	70	Sakenichie	Sakenichie A3	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	64	Middle B	Takatoot A10	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	64	Middle B	Takatoot A11	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	64	Middle B	Takatoot A4	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	83	Tchentlo 27	Purvis A6	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	64	Middle B	Takatoot A3	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	63	Middle A	Baptiste A7	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	70	Sakenichie	MacDouall A1	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	82	Tchentlo 25	Tchentlo A7	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	63	Middle A	Middle A2	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	83	Tchentlo 27	Purvis A5	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	63	Middle A	Baptiste A4	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	88	Whitefish	Whitefish A2	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	70	Sakenichie	Sakenichie A5	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	82	Tchentlo 25	Tchentlo A4	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	47	Beaver/Salmon	Carrier A1	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	64	Middle B	Elliot A1	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	63	Middle A	Baptiste A6	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	71	North Salmon	Squawfish A1	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	88	Whitefish	Whitefish A1	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	83	Tchentlo 27	Purvis A8	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required

PG	FSJ	64	Middle B	Takatoot A2	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	64	Middle B	Elliot A6	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	63	Middle A	Middle A6	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	63	Middle A	Middle A8	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	63	Middle A	Middle A1	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	FSJ	63	Middle A	Baptiste A9	Canfor	FAR	site	500	unranked	WRP Planning	field assessment for fish passage required
PG	MK	178	Scovil (Modeste)	O5H	MoF	RD	16	8,838	L	DM Liability	
PG	MK	178	Scovil (Modeste)	O6B & O6C	MoF	RD	5.2	4,692	L	DM Liability	
PG	MK	178	Scovil (Modeste)	15J1	MoF	RD	2.2	1,797	L	DM Liability	
PG	MK	178	Scovil (Modeste)	O24E	MoF	RD	0.9	1,845	L	DM Liability	
PG	MK	178	Scovil (Modeste)	O25A	MoF	RD	2	27,085	L	DM Liability	
PG	MK	159	McLeod (McDougall)	93J936	MoF	RD	5.5	10,090	L	DM Liability	
PG	MK	159	McLeod (McDougall)	93J931	MoF	RD	4.8	6,508	L	DM Liability	
PG	MK	159	McLeod (McDougall)	93J921B5, 93J921B5A, 93J921B5B, & 93J921B5C	MoF	RD	4.1	3,676	L	DM Liability	
PG	MK	174	Philip	93J921B3B, 93J921B3F, 93J921B3E, & 93J921B3E1,	MoF	RD	11	4,930	L	DM Liability	
PG	MK	174	Philip	93J927, 93J927A, & 93J927B,	MoF	RD	4.5	2,825	L	DM Liability	
PG	MK	174	Philip	93J924 & 93J924B	MoF	RD	9.4	6,234	L	DM Liability	
PG	MK	174	Philip	O2P1	MoF	RD	1	2,245	L	DM Liability	
PG	MK	174	Philip	O2O	MoF	RD	4.2	3,387	L	DM Liability	
PG	MK	174	Philip	O2I & O2I1	MoF	RD	1.2	2,307	L	DM Liability	
PG	MK	174	Philip	O2H, O2H1, O2H2, O2H4, O2H5, O2H5A, & O2H6	MoF	RD	2.1	3,721	L	DM Liability	
PG	MK	174	Philip	O2J, O2J1, O2J1A, O2J1B, O2J2, & O2J2A	MoF	RD	4	5,115	L	DM Liability	
PG	MK	174	Philip	O2L, O2L1, & O2L2	MoF	RD	0.8	2,228	L	DM Liability	
PG	MK	174	Philip (Robinson)	O3B	MoF	RD	13.4	24,329	L	DM Liability	
PG	MK	174	Philip (Robinson)	03C	MoF	RD	1.6	5,526	L	DM Liability	
PG	MK	174	Philip (Robinson)	O3D & O3D1	MoF	RD	1.8	2,333	L	DM Liability	

PG	MK	174	Philip (Robinson)	O3E	MoF	RD	7.3	10,494	L	DM Liability	
PG	MK	174	Philip (Robinson)	O3F	MoF	RD	7.3	23,980	L	DM Liability	
PG	MK	174	Philip (Robinson)	O12B	MoF	RD	7	3,405	L	DM Liability	
PG	MK	164	Nation	O32L1	MoF	RD	0.4	3,079	L	DM Liability	
PG	MK	137	Blackwater	O51A & O51A1	MoF	RD	5	6,780	L	DM Liability	
PG	MK	137	Blackwater	O51D, O51D4, & O51D5	MoF	RD	3	4,390	L	DM Liability	
PG	MK	157	Manson	N60E	MoF	RD	6	7,550	L	DM Liability	
PG	MK	157	Manson	O61F	MoF	RD	6	20,100	L	DM Liability	
PG	MK	157	Manson	N70B2	MoF	RD	1	4,760	L	DM Liability	
PG	MK	148	Gaffney	N50A3	MoF	RD	1.5	3,610	L	DM Liability	
PG	MK	148	Gaffney	N50B & N50B4	MoF	RD	11.4	13,474	L	DM Liability	
PG	MK	157	Manson	N50C6	MoF	RD	6.6	3,251	L	DM Liability	
PG	MK	157	Manson	N60B	MoF	RD	9	6,430	L	DM Liability	
PG	MK	157	Manson	N60D	MoF	RD	5	4,612	L	DM Liability	
PG	MK	150	Germansen	N76A3	MoF	RD	0.5	1,130	L	DM Liability	
PG	MK	141	Davis (Williston)	O44B3	MoF	RD	0.4	1,739	L	DM Liability	
PG	MK	137	Blackwater	O51H & O51H1	MoF	RD	3	3,420	L	DM Liability	
PG	MK	137	Blackwater	O53M9	MoF	RD	1	2,315	L	DM Liability	
PG	MK	137	Blackwater	O53G	MoF	RD	1.5	3,090	L	DM Liability	
PG	MK	137	Blackwater	O53K3	MoF	RD	1	2,220	L	DM Liability	
PG	MK	137	Blackwater	O53L	MoF	RD	1.2	2,987	L	DM Liability	
PG	MK	141	Davis (Williston)	O53J3	MoF	RD	0.5	3,340	L	DM Liability	
PG	MK	141	Davis (Williston)	O53F2A	MoF	RD	1.2	4,772	L	DM Liability	
PG	MK	137	Blackwater	O61E	MoF	RD	1.6	2,966	L	DM Liability	
PG	MK	137	Blackwater	O61C3	MoF	RD	6	3,850	L	DM Liability	
PG	MK	167	Osilinka	C16C3 & C16C3A	MoF	RD	1.3	4,198	L	DM Liability	

PG	DC	265	Sukunka (Upper)	Bridge de-activation	MoF	RD	1	20,000	H	Public Safety	
PG	DJO	n/a	District-wide	Road deactivation ranking	MoF	DA	1343km	20,000	H	WRP Planning	Data derived from 1998 District-wide road inventory project
PG	DJO	n/a	District-wide	Road statusing / inspect.	MoF	DA	163km	10,000	H	WRP Planning	Data derived from 1998 District-wide road inventory project
PG	DJO	n/a	District-wide	Expired CP road inspect.	MoF	DA	2028km	20,000	H	WRP Planning	Data derived from 1998 District-wide road inventory project
PG	DJO	n/a	District-wide	Seismic/Trim road review	MoF	DA	13,110km	10,000	H	WRP Planning	Data derived from 1998 District-wide road inventory project
PG	DJO	n/a	District-wide	Misc. Road Deactivation	MoF	RD	n/a	200,000	H	DM liability	Will include some Effectivness Evaluation
					Prince George Region Total:			**5,484,653**			

7 FOREST SERVICE ROAD MANAGEMENT PROGRAM

7.1 FSR REGIONAL ISSUES AND PRIORITIES

A Roads Management working group evaluated the Forest Service roads maintenance and bridge replacement requirements throughout the region. An estimated 1766 km of Forest Service road which fall directly under the responsibilities of Forest District Managers in the Prince George Forest Region.

Key issues reported in the analysis are:

- The impact of potential budget reductions in 2001/02 will be worsened by higher heavy machinery rental rates expected to offset fuel price increases.
- As sections of road are turned over to the Ministry (as road permits lapse), decisions regarding temporary or permanent closure must be made in order to prudently manage government liabilities. Greater risk to public safety and private property damage are inevitable if road access is maintained in the absence of adequate maintenance.
- Impacts to the Small Business Forest Enterprise Program are expected to increase as roads cannot be maintained awaiting future SBFEP users expected when current market down-turns reverse.
- Delayed or deferred maintenance on roads infrastructure in the present will commit the Ministry into higher future costs associated with right-of-way reconstruction. Biannual brushing and grading costs are approximately $700/km, compared with $5 000 to $10 000/km for reconstruction of ditches and shoulders.
- Road clearing on Forest Service roads providing public access to remote communities and residences will decline with potential budget reductions.
- Some Forest Districts have up to 10 000 km of unclassified roads and trails not included in the present analysis.

7.2 MANAGEMENT UNIT FSR ISSUES AND PRIORITIES

7.2.1 PRINCE GEORGE FOREST DISTRICT

Table 7.2.1.1 Engineering Program Resource Management Plan for 2001/02

ACTIVITY	ACCOUNT	PRIORITY	OUTPUT	OUTPUT		ESTIMATED COSTS			TOTAL	BUDGET	ACTUAL	COMMENTS
			UNITS	GOALS	BASE $	CUMUL. BASE $	INCR. $	CUMUL. INCR. $	EST. $	ALLOC.	COSTS	
Fixed Costs (region $):												
Right-of-way acquisition	*40802*	H	NO.			0	0		0			
emergency repairs	*40803*	H	NO.			0	0		0			Held at Region
inspection of bridges/major culverts	*40804*	H	NO.			0	0		0			Handled out of Region
railway crossing maint.	*40805*	H	NO.	12	6200	6200	0		6200			
subtotal					6200		0		6200			
Surface Maintenance +	*40805*	H	KM	100	300000	306200	0	0	300000			
Non Modification Repairs		M	KM	552	0	306200	350000	350000	350000			
(e.g., grading, brushing, cross drain culvert repairs, ditch cleanout, bridge deck cleaning and repair, road surfacing)		L	KM	90	0	306200	45000	395000	45000			
subtotal				742	300000		395000		695000			
Modification-Bridge and	*40806*	H	NO.	16	1390000	1696200	0	395000	1390000			
Major Culvert Replacement	*or*	M	NO.	5	0	1696200	25000	420000	25000			
(needs road layout and design)	*40812*	L	NO	4	0	1696200	10000	430000	10000			

subtotal					1390000		35000		1425000			
Modification-Other Works	*40807*	H	NO.	4	10000	1706200	0	430000	10000			
(needs road layout and design)		M	NO	2	0	1706200	4000	434000	4000			
(e.g., road relocation, stream culvert replacement, road stability repair)		L	NO	4	0	1706200	12000	446000	12000			
subtotal					10000		16000		26000			
Road Deactivation	*40808*	H	KM	8	28000	1734200	0	0	28000			
		M	KM	4	0	1734200	14000	14000	14000			
		L	KM	12	0	1734200	42000	56000	42000			
subtotal					28000		56000		84000			
TOTAL					$1,734,200		$502,000		$2,236,200			

7.2.2 ROBSON VALLEY FOREST DISTRICT

Table 7.2.1.2 Engineering Program Resource Management Plan

ACTIVITY	ACCOUNT	PRIORITY	OUTPUT	OUTPUT		ESTIMATED COSTS			TOTAL	BUDGET	ACTUAL	COMMENTS
			UNITS	GOALS	BASE $	CUMUL. BASE $	INCR. $	CUMUL. INCR. $	EST. $	ALLOC.	COSTS	
Fixed Costs (region $):												
Right-of-way acquisition	*40802*	H	NO.	1	2000	2000	0		2000			Sand Creek FSR
emergency repairs	*40803*	H	NO.			2000	0		0			Held at Region
inspection of bridges/major culverts	*40804*	H	NO.			2000	0		0			Handled out of Region
railway crossing maint.	*40805*	H	NO.	2	600	2600	0		600			2.49 TJ sub &64.4 Asub
subtotal					2600		0		2600			
Surface Maintenance +	*40805*	H	KM	50	10000	12600	0	0	10000			
Non Modification Repairs		M	KM		0	12600		0	0			
(e.g., grading, brushing, cross drain culvert repairs, ditch cleanout, bridge deck cleaning and repair, road surfacing)		L	KM		0	12600		0	0			
subtotal				50	10000		0		10000			
Modification-Bridge and	*40806*	H	NO.	1	160000	172600	0	0	160000			G3021 Kiwa Creek
Major Culvert Replacement	*or*	M	NO.	1	0	172600	60000	60000	60000			G3051 CN Morkill Deck
(needs road layout and design)	*40812*	L	NO.	1	0	172600	50000	110000	50000			G3092 Gold Ck culvert
subtotal					160000		110000		270000			
Modification-Other Works	*40807*	H	NO	1	5000	177600	0	110000	5000			Minnow Creek rechannel
(needs road layout and design)		M	NO		0	177600		110000	0			

(e.g., road relocation, stream culvert replacement, road stability repair)		L	NO		0	177600		110000	0		
subtotal					5000		0		5000		
Road Deactivation	*40808*	H	KM			177600	0	0	0		
		M	KM		0	177600		0	0		
		L	KM		0	177600		0	0		
subtotal					0		0		0		
TOTAL					$177,600		$110,000		$287,600		

7.2.3 VANDERHOOF FOREST DISTRICT

Table 7.2.1.3 Engineering Program Resource Management Plan

ACTIVITY	ACCOUNT	PRIORITY	OUTPUT UNITS	OUTPUT GOALS	ESTIMATED COSTS				TOTAL EST. $	BUDGET ALLOC.	ACTUAL COSTS	COMMENTS
					BASE $	CUMUL. BASE $	INCR. $	CUMUL. INCR. $				
Fixed Costs (region $):												
Right-of-way acquisition	40802	H	NO.			0	0		0			
emergency repairs	40803	H	NO.			0	0		0			Held at Region
inspection of bridges/major culverts	40804	H	NO.			0	0		0			Handled out of Region
railway crossing maint.	40805	H	NO.			0	0		0			
subtotal					0		0		0			
Surface Maintenance +	40805	H	KM	100	20000	20000	0	0	20000			
Non Modification Repairs		M	KM	177		20000	40000	40000	40000			
(e.g., grading, brushing, cross drain culvert repairs, ditch cleanout, bridge deck cleaning and repair, road surfacing)		L	KM	100	0	20000	15000	55000	15000			
subtotal				377	20000		55000		75000			
Modification-Bridge and	40806	H	NO	3	240000	260000	0	55000	240000			
Major Culvert Replacement	or	M	NO		0	260000		55000	0			
(needs road layout and design)	40812	L	NO		0	260000		55000	0			
subtotal					240000		0		240000			
Modification-Other Works	40807	H	NO	5	130000	390000	0	55000	130000			
(needs road layout and design)		M	NO		0	390000		55000	0			

(e.g., road relocation, stream culvert replacement, road stability repair)		L	NO		0	390000		55000	0			
subtotal					130000		0		130000			
Road Deactivation	*40808*	H	KM			390000	0	0	0			
		M	KM		0	390000		0	0			
		L	KM		0	390000		0	0			
subtotal					0		0		0			
TOTAL					$390,000		$55,000		$445,000			

7.2.4 FORT ST. JAMES FOREST DISTRICT

Table 7.2.1.4 Engineering Program Resource Management Plan

ACTIVITY	ACCOUNT	PRIORITY	OUTPUT UNITS	OUTPUT GOALS	ESTIMATED COSTS				TOTAL EST. $	BUDGET ALLOC.	ACTUAL COSTS	COMMENTS
					BASE $	CUMUL. BASE $	INCR. $	CUMUL. INCR. $				
Fixed Costs (region $):												
Right-of-way acquisition	*40802*	H	NO.			0	0		0			
emergency repairs	*40803*	H	NO.			0	0		0			Held at Region
inspection of bridges/major culverts	*40804*	H	NO.			0	0		0			Handled out of Region
railway crossing maint.	*40805*	H	NO.			0	0		0			
subtotal					0		0		0			
Surface Maintenance +	*40805*	H	KM	38	24500	24500	0	0	24500			
Non Modification Repairs		M	KM	70	0	24500	26000	26000	26000			
(e.g., grading, brushing, cross drain culvert repairs, ditch cleanout, bridge deck cleaning and repair, road surfacing)		L	KM	29	0	24500	7000	33000	7000			
subtotal					24500		33000		57500			
Modification-Bridge and	*40806*	H	NO.	7	610000	634500	0	33000	610000			
Major Culvert Replacement	*or*	M	NO.		0	634500		33000	0			
(needs road layout and design)	*40812*	L	NO.		0	634500		33000	0			
subtotal					610000		0		610000			
Modification-Other Works	*40807*	H	NO.	15	165000	799500	0	33000	165000			
(needs road layout and design)		M	NO.		0	799500		33000	0			

(e.g., road relocation, stream culvert replacement, road stability repair)		L	NO		0	799500		33000	0			
subtotal					165000		0		165000			
Road Deactivation	*40808*	H	KM	35	17000	816500	0	0	17000			35 km of prescriptions
		M	KM		0	816500		0	0			
		L	KM		0	816500		0	0			
subtotal					17000		0		17000			
TOTAL					$816,500		$33,000		$849,500			

7.2.5 MACKENZIE FOREST DISTRICT

Table 7.2.1.5 Engineering Program Resource Management Plan

ACTIVITY	ACCOUNT	PRIORITY	OUTPUT UNITS	OUTPUT GOALS	ESTIMATED COSTS				TOTAL EST. $	BUDGET ALLOC.	ACTUAL COSTS	COMMENTS
					BASE $	CUMUL. BASE $	INCR. $	CUMUL. INCR. $				
Fixed Costs (region $):												
Right-of-way acquisition	*40802*	H	NO.			0	0		0			
emergency repairs	*40803*	H	NO.			0	0		0			Held at Region
inspection of bridges/major culverts	*40804*	H	NO.			0	0		0			Handled out of Region
railway crossing maint	*40805*	H	NO.	3	6000	6000	0		6000			
subtotal					6000		0		6000			
Surface Maintenance +	*40805*	H	KM	30	80800	86800	0	0	80800			
Non Modification Repairs		M	KM	235	0	86800	450000	450000	450000			
(e.g., grading, brushing, cross drain culvert repairs, ditch cleanout, bridge deck cleaning and repair, road surfacing)		L	KM	30	0	86800	50000	500000	50000			
subtotal				295	80800		500000		580800			
Modification-Bridge and	*40806*	H	NO.	6	350000	436800	0	500000	350000			
Major Culvert Replacement	*or*	M	NO.	4		436800	20000	520000	20000			
(needs road layout and design)	*40812*	L	NO.		0	436800		520000	0			
subtotal					350000		20000		370000			
Modification-Other Works	*40807*	H	NO.	5	42000	478800	0	520000	42000			

(needs road layout and design)		M	NO.		0	478800		520000	0			
(e.g., road relocation, stream culvert replacement, road stability repair)		L	NO.		0	478800		520000	0			
subtotal					42000		0		42000			
Road Deactivation	*40808*	H	KM			478800	0	0	0			
		M	KM	191.4		478800	280000	280000	280000			
		L	KM		0	478800		280000	0			
subtotal					0		280000		280000			
TOTAL					$478,800		$800,000		$1,278,800			

7.2.6 DAWSON CREEK FOREST DISTRICT

Table 7.2.1.6 Engineering Program Resource Management Plan

ACTIVITY	ACCOUNT	PRIORITY	OUTPUT	OUTPUT	ESTIMATED COSTS				TOTAL	BUDGET	ACTUAL	COMMENTS
			UNITS	GOALS	BASE $	CUMUL. BASE $	INCR. $	CUMUL. INCR. $	EST. $	ALLOC.	COSTS	
Fixed Costs (region $):												
Right-of-way acquisition	*40802*	H	NO.			0	0		0			
emergency repairs	*40803*	H	NO.			0	0		0			Held at Region
inspection of bridges/major culverts	*40804*	H	NO.			0	0		0			Handled out of Region
railway crossing maint.	*40805*	H	NO.			0	0		0			
subtotal					0		0		0			
Surface Maintenance +	*40805*	H	KM	30	20000	20000	0	0	20000			
Non Modification Repairs		M	KM	30		20000	22500	22500	22500			
(e.g., grading, brushing, cross drain culvert repairs, ditch cleanout, bridge deck cleaning and repair, road surfacing)		L	KM	10	0	20000	5000	27500	5000			
subtotal					20000		27500		47500			
Modification-Bridge and	*40806*	H	NO.	2	100000	120000	0	27500	100000			
Major Culvert Replacement	*or*	M	NO.		0	120000		27500	0			
(needs road layout and design)	*40812*	L	NO.		0	120000		27500	0			
subtotal					100000		0		100000			
Modification-Other Works	*40807*	H	NO.	5	130000	250000	0	27500	130000			
(needs road layout and design)		M	NO		0	250000		27500	0			

(e.g., road relocation, stream culvert replacement, road stability repair)		L	NO.		0	250000		27500	0			
subtotal					130000		0		130000			
Road Deactivation	*40808*	H	KM			250000	0	0	0			
		M	KM		0	250000		0	0			
		L	KM		0	250000		0	0			
subtotal					0		0		0			
TOTAL					$250,000		$27,500		$277,500			

7.2.7 FORT ST. JOHN FOREST DISTRICT

Table 7.2.1.7 Engineering Program Resource Management Plan

ACTIVITY	ACCOUNT	PRIORITY	OUTPUT UNITS	OUTPUT GOALS	ESTIMATED COSTS BASE $				TOTAL EST. $	BUDGET ALLOC.	ACTUAL COSTS	COMMENTS
					BASE $	CUMUL. BASE $	INCR. $	CUMUL. INCR. $				
Fixed Costs (region $):												
Right-of-way acquisition	*40802*	H	NO.			0	0		0			
emergency repairs	*40803*	H	NO.			0	0		0			Held at Region
inspection of bridges/major culverts	*40804*	H	NO.			0	0		0			Handled out of Region
railway crossing maint.	*40805*	H	NO.			0	0		0			
subtotal					0		0		0			
Surface Maintenance +	*40805*	H	KM	20	20000	20000	0	0	20000			
Non Modification Repairs		M	KM	25		20000	22500	22500	22500			
(e.g., grading, brushing, cross drain culvert repairs, ditch cleanout, bridge deck cleaning and repair, road surfacing)		L	KM	5	0	20000	5000	27500	5000			
subtotal				50	20000		27500		47500			
Modification-Bridge and	*40806*	H	NO.			20000	0	27500	0			
Major Culvert Replacement	*or*	M	NO.		0	20000		27500	0			
(needs road layout and design)	*40812*	L	NO.		0	20000		27500	0			
subtotal					0		0		0			
Modification-Other Works	*40807*	H	NO	4	100000	120000	0	27500	100000			
(needs road layout and design)		M	NO		0	120000		27500	0			

(e.g., road relocation, stream culvert replacement, road stability repair)		L	NO.		0	120000		27500	0			
subtotal					100000		0		100000			
Road Deactivation	*40808*	H	KM			120000	0	0	0			
		M	KM		0	120000		0	0			
		L	KM		0	120000		0	0			
subtotal					0		0		0			
TOTAL					$120,000		$27,500		$147,500			

7.2.8 FORT NELSON FOREST DISTRICT

Table 7.2.1.8 Engineering Program Resource Management Plan

ACTIVITY	ACCOUNT	PRIORITY	OUTPUT	OUTPUT		ESTIMATED COSTS			TOTAL	BUDGET	ACTUAL	COMMENTS
			UNITS	GOALS	BASE $	CUMUL. BASE $	INCR. $	CUMUL. INCR. $	EST. $	ALLOC.	COSTS	
Fixed Costs (region $):												
Right-of-way acquisition	*40802*	H	NO.			0	0		0			
emergency repairs	*40803*	H	NO.			0	0		0			Held at Region
inspection of bridges/major culverts	*40804*	H	NO.			0	0		0			Handled out of Region
railway crossing maint.	*40805*	H	NO.			0	0		0			
subtotal					0		0		0			
Surface Maintenance +	*40805*	H	KM	45	20000	20000	0	0	20000			
Non Modification Repairs		M	KM			20000		0	0			
(e.g., grading, brushing, cross drain culvert repairs, ditch cleanout, bridge deck cleaning and repair, road surfacing)		L	KM		0	20000		0	0			
subtotal				45	20000		0		20000			
Modification-Bridge and	*40806*	H	NO.			20000	0	0	0			
Major Culvert Replacement	*or*	M	NO.		0	20000		0	0			
(needs road layout and design)	*40812*	L	NO.		0	20000		0	0			
subtotal					0		0		0			
Modification-Other Works	*40807*	H	NO.	2	30000	50000	0	0	30000			
(needs road layout and design)		M	NO.		0	50000		0	0			

(e.g., road relocation, stream culvert replacement, road stability repair)		L	NO		0	50000		0	0			
subtotal					30000		0		30000			
Road Deactivation	*40808*	H	KM			50000	0	0	0			
		M	KM		0	50000		0	0			
		L	KM		0	50000		0	0			
subtotal					0		0		0			
TOTAL					$50,000		$0		$50,000			

7.2.9 PRINCE GEORGE REGIONAL ENGINEERING SECTION

Table 7.2.1.9 Engineering Program Resource Management Plan

ACTIVITY	ACCOUNT	PRIORITY	OUTPUT UNITS	OUTPUT GOALS	ESTIMATED COSTS				TOTAL EST. $	BUDGET ALLOC.	ACTUAL COSTS	COMMENTS
					BASE $	CUMUL. BASE $	INCR. $	CUMUL. INCR. $				
Fixed Costs (region $):												
Right-of-way acquisition	40802	H	NO			0	0		0			
emergency repairs	40803	H	NO.	10	200000	200000	0		200000			Held at Region
inspection of bridges/major culverts	40804	H	NO.	300	50000	250000	0		50000			Handled out of Region
railway crossing maint.	40805	H	NO.			250000	0		0			
subtotal					250000		0		250000			
Surface Maintenance +	40805	H	KM			250000	0	0	0			
Non Modification Repairs		M	KM		0	250000		0	0			
(e.g., grading, brushing, cross drain culvert repairs, ditch cleanout, bridge deck cleaning and repair, road surfacing)		L	KM		0	250000		0	0			
subtotal					0		0		0			
Modification-Bridge and	40806	H	NO.			250000	0	0	0			
Major Culvert Replacement	or	M	NO.	20	0	250000	2595000	2595000	2595000			
(needs road layout and design)	40812	L	NO.	20	0	250000	2190000	4785000	2190000			
subtotal					0		4785000		4785000			
Modification-Other Works	40807	H	NO.			250000	0	4785000	0			
(needs road layout and design)		M	NO.		0	250000		4785000	0			

(e.g., road relocation, stream culvert replacement, road stability repair)		L	NO			0	250000		4785000	0		
subtotal						0		0		0		
Road Deactivation	*40808*	H	KM				250000	0	0	0		
		M	KM			0	250000		0	0		
		L	KM			0	250000		0	0		
subtotal						0		0		0		
TOTAL						$250,000		$4,785,000		$5,035,000		

8 STRENGTHENING SUSTAINABLE FOREST MANAGEMENT

8.1 REGIONAL SOURCE DOCUMENT

The information contained in this section was extracted from the locally developed Terms of Reference document, and includes a discussion of the regional context for the Strengthening Sustainable Forest Management (SSFM) strategic objective, and the regional framework within which the RMP planning was undertaken.

8.1.1 REGIONAL CONTEXT

The Strengthening Strategic Forest Management (SSFM) strategic objective addresses the need for improved forest ecosystem knowledge, management techniques and innovations necessary to attain sustainable forest management.

During its first five years, Forest Renewal invested in knowledge aimed at operational level forest planning and management. This was necessary to implement the new policies and practices of the Forest Practices Code. Investments were primarily inventory projects, administered through the Inventory Program. The SSFM strategic objective for 2001-2004 shifts investment focus from operations to higher-level strategic decisions and planning processes, and will require a broader range of investment activities. While inventory investments will remain part of the SSFM program, they will be redirected to strategic-level issues, planning needs and decisions.

Sustainable forest management (SFM) and ecosystem management are synonymous. Successful SFM requires a management approach that recognises an integrated set of forested ecosystem variables, which in turn determine environmental, socio-economic and cultural values and forest benefits. SFM principles consider a wide range of timber and non-timber resource elements, including species and habitat diversity, soil and water conservation, forest ecosystem structure and function at the local, regional and global level, as well as the many societal benefits forests provide. SFM also considers the participatory roles and rights of forest dependent communities and First Nations.

The Forest Renewal BC SSFM objective focuses specifically on knowledge acquisition aimed at two aspects of sustainable forest management: maintenance of environmental values and resource benefits (including traditional {timber}and non-traditional forest products, and eco-tourism). Investments in improved knowledge must be at the higher planning levels of management, namely the forest or landscape levels and must therefore focus at the strategic, rather than the operational (site or stand) level of resolution, for improved SFM decision-making. SSFM investments within the 2001/2002 RMP will provide forest managers with new or improved knowledge about the impacts of alternative management practices on forest ecosystem processes, functions, values and benefits. Investment priority will favour knowledge aimed at the maintenance of environmental and resource values most at risk from forest management decisions.

8.1.2 PLANNING FRAMEWORK

The document *"2001-02 RMP Ground Rules"* (Appendix 1.1) jointly developed by the Ministries of Forests, Environment Lands and Parks, and Forest Renewal BC for the Omineca-Peace Region defines the general planning framework for Resource Management Planning. Three principles underlie the SSFM planning process in the Omineca-Peace Region:

The Planning Committee personnel, the planning process, and the final SSFM Regional RMP must have the approval and support of senior managers from both resource agencies, and Forest Renewal BC;

The process and final plan must reflect a collaborative effort involving resources agency staff and key Forest Renewal stakeholders;

The final, Regional SSFM Resource Management Plan must be submitted to Forest Renewal BC, Omineca-Peace Region on or before September 30, 2000, in the appropriate format and with the required content as defined in the *"Resource Management Plan for Strengthening Sustainable Forest Management (SSFM) Guidelines, May 2000"*.

A hierarchical planning framework with specifically assigned planning roles was adopted as the best means of adhering to these planning principles. Figure 8.1 illustrates the three level process defined in the Omineca-Peace RMP *Ground Rules*. The planning roles at each level of the hierarchy are briefly described, subsequently.

8.1.2.1 RMP STEERING COMMITTEE

Level 1 of the planning hierarchy consisted of a multi-agency steering committee responsible for ensuring all 10 components of the Regional RMP (including SSFM) were undertaken according to the approved planning guidelines, and within the overall planning timeframe.

Forest Renewal BC, Omineca-Peace Region; the Ministry of Forests, Prince George Region; and the Ministry of Environment, Lands and Parks, Omineca-Peace Region each appointed representatives to serve on the RMP Steering Committee. The role of this committee in SSFM planning was to facilitate agency support for the SSFM Technical Planning Committee (see Figure 8.1). The RMP Steering committee recommended SSFM committee membership, monitored the planning progress, and communicated committee achievements and planning resource requirements to the Regional Director of Forest Renewal, Omineca-Peace Region, the Regional Manager, Ministry of Forests, Prince George Region and the Regional Director, Ministry of Environment, Lands and Parks, Omineca-Peace Region.

The RMP Steering Committee ensured that appropriate, collaborative input was incorporated into the SSFM plan at the regional and district planning levels, and that adequate staff support resources from both Ministry's were made available. The RMP Steering Committee also ensured that all critical timeframes for plan completion were met. RMP Steering Committee members, and the reporting relationship of each Committee member is described in Table 8.1.

Table 8.1 RMP Steering Committee membership and reporting relationship

Committee Member	**Responsible to:**	**Designated Alternate:**
Bill Jensen, Investment Officer, FRBC OP Region	Joyce Beaudry, Director, FRBC OP Region	
Beryl Nesbit, Habitat Biologist, MoELP, OP Region	Wally Eamer, Director, MoELP, OP Region	John Metcalfe, FWH Manager, MoELP, OP Region
Tim Silbernagel, Watershed Technician, MoF, PGgion	Ray Schultz, Regional Manager, MoF, Prince George Region	Wayne Martin, Forestry Manager, MoF, Prince George Region
Les Herring, FRBC Planner, MoF, Prince George Region	Ray Schultz, Regional Manager, MoF, Prince George Region	Wayne Martin, Forestry Manager, MoF, Prince George Region

Each member of the Committee represented the interests of their respective Regional Director or Regional Manager, or his designate, to ensure that all terms of the Services Agreement between Forest Renewal BC and the two agencies were fully satisfied in the plan.

8.1.2.2 REGIONAL TECHNICAL PLANNING COMMITTEE

Level 2 of the SSFM planning hierarchy consisted of a technical planning committee of resource specialists. The primary role of the Regional Technical Planning Committee was to identify and prioritize key SSFM issues, and investment project solutions within the Omineca/Peace Region. The committee consisted of a representative from each resource agency, the Interagency Management Committee, and the Northern Forest Products Association. The membership representation and reporting relationships of the Regional SSFM Technical Planning Committee is described in Table 8.2.

The Regional Technical Planning Committee was coordinated by Mr. Les Herring. The principle role of the Coordinator was to provide planning support to the committee in the following areas:

- preparation of a detailed Terms of Reference for the Regional SSFM Technical Planning Committee;
- providing planning process orientation to members of the committee and other agency planning staff;
- preparation of draft and final plan documents;
- maintaining communication with District Planning Teams (see Figure 8.1) to ensure local agency and stakeholder input into the Regional plan;
- preparing a committee project management plan with progress milestones and critical paths;
- assisting committee members in communication and liaison with senior agency managers, and District Planning Teams.

Table 8.2 SSFM Technical Planning Committee membership and reporting responsibility.

Committee Member	Representing:	Resonsible to:
Dick Nakatsu, Senior Inventory Officer, MoF, Prince George Region	MoF, Prince George Region	Lynda Curry, MoF Regional Staff Manager, Planning and LIM, Prince George Forest Region.
Beryl Nesbit, Forest Renewal Co-ordinator, MoELP, Omineca-Peace Region	MoELP,Omineca-Peace Region	John Metcalfe MoELP Fisheries, Wildlife and Habitat Manager, O/P Region
Dan Adamson, Interagency Management Committee (IAMC) Manager	Land Use Coordination Office (LUCO)	MoF Regional Manager and MoELP Regional Director,
Kerry Deschamps FRBC Coordinator Wood Products - Prince George Operations Canadian Forest Products Ltd.	Northern Forest Products Association	Doug Routledge NFPA Manager

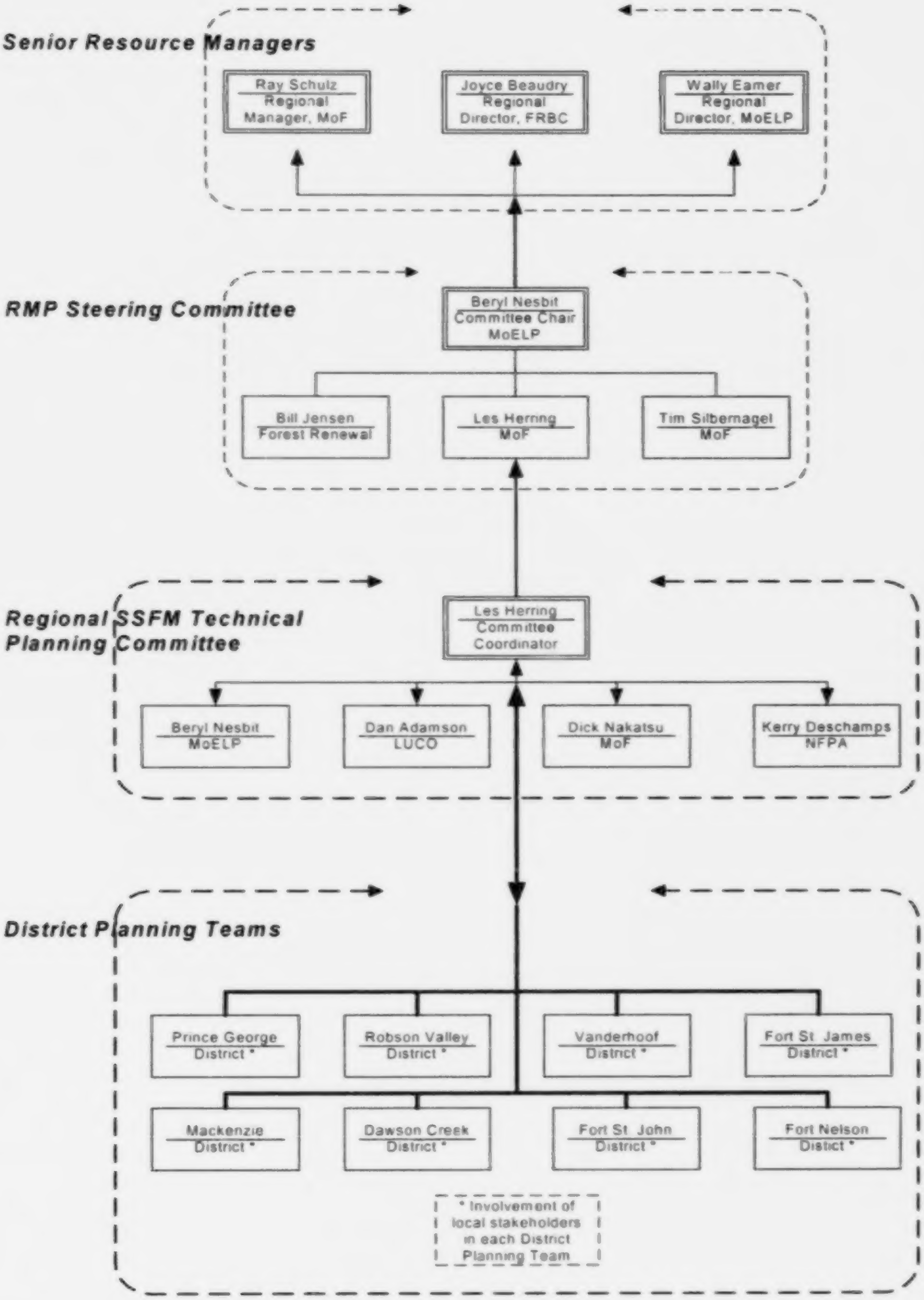
Senior Resource Managers
Ray Schulz
Regional Manager, MoF
Joyce Beaudry
Regional Director, FRBC
Wally Eamer
Regional Director, MoELP
RMP Steering Committee
Beryl Nesbit
Committee Chair
MoELP
Bill Jensen
Forest Renewal
Les Herring
MoF
Tim Silbernagel
MoF
Regional SSFM Technical Planning Committee
Les Herring
Committee Coordinator
Beryl Nesbit
MoELP
Dan Adamson
LUCO
Dick Nakatsu
MoF
Kerry Deschamps
NFPA
District Planning Teams
Prince George
District *
Robson Valley
District *
Vanderhoof
District *
Fort St. James
District *
Mackenzie
District *
Dawson Creek
District *
Fort St. John
District *
Fort Nelson
Distict *
* Involvement of local stakeholders in each District Planning Team

Figure 8.1 **The Strengthening Sustainable Forest Management Plan will be developed through a three level hierarchical planning process.**

8.1.2.3 DISTRICT PLANNING TEAMS

Level 3 of the planning hierarchy consisted of 8, local planning committees. Each Forest District organised an SSFM planning team, the structure and membership of which remained at the discretion of the District Manager, while meeting the intent of the *Ground Rules* regarding the involvement of key, local stakeholders.

The primary role of the District Planning Teams was to assist the Regional SSFM Technical Planning Committee in the identification and description of SSFM issues. District Planning Teams, in collaboration with their local stakeholders, were best able to provide local context and priority ranking to SSFM issues of regional significance. District Planning Teams will also assist the Regional Technical Planning Committees at later phases of planning by reviewing and commenting on project investment solutions, as well as the draft SSFM Resource Management Plans.

The membership of each District SSFM Planning Team was at the discretion of the team chair and their district management team. Table 8.3 identifies the forest district officers who chaired the District planning teams.

Table 8.3 District Planning Team Chairs

District	District Officer	Position
Prince George	Mr. Bob Richards	Zone Officer
Robson Valley	Ms. Norma Stromberg-Jones	Forest Practices Code Officer
Vanderhoof	Mr. Norm Fallows[43]	Watershed Restoration Technician
Fort St. James	Ms. Susan Salokannel	Zone Forester
Mackenzie	Mr. Steve Dodds	District Planning Officer
Dawson Creek	Ms. Winn Hays-Byl	Integrated Resource Analysis Planner
Fort St. John	Mr. Brian Farwell	Forest Renewal Silviculture Officer
Fort Nelson	Ms. Alena Terry[44]	FRBC Forester

8.1.3 THE PLANNING PROCESS

The planning process to September 30, 2000, consisted of the following 5 phases:

8.1.3.1 PREPARATION

Regional Technical Planning Committee Evolution

Based on interim SSFM guidebook instructions, a Regional Technical Planning team was designated, consisting of Beryl Nesbit, Dick Nakatsu, Dan Adamson, David Maloney (MoF Hydrologist), and Betty Schweizer (MoF Timber Supply Manager). Initial plans called for Dan Adamson to facilitate the work of the Planning Team.

Final SSFM guidelines were presented at a provincial meeting in Vancouver on June 5, 2000. Les Herring, Dan Adamson, Dave Maloney and Winn Hays-Byl (MoF Dawson Creek Planner) attended this meeting. Earlier instructions calling for a facilitator had been revised, and now recommended that the services of a Regional Planning Team Co-ordinator be secured, with a considerably greater role to play in the planning process. Several options were explored, including securing the services of a consultant co-ordinator. It was considered more expedient, and appropriate, however, that the Regional FRBC planner assume the co-ordinator role. This decision was confirmed with the Forest Renewal Regional Director on June 26, 2000.

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[43] Replaced by Mr. Dave Sommerville August 15, 2000.

[44] Replaced Ljiljana Knezevic during mid-July, 2000

The Co-ordinator subsequently re-organised and recruited the existing members of the Regional Technical Planning Committee, and the initial planning meeting was held on July 18, 2000.

District Planning Team Orientation and Organisation

A Regional SSFM orientation workshop was held in Prince George on June 23, 2000. This meeting was not well attended by staff from all districts, nor by all stakeholders of SSFM process. Table 8.4 lists workshop participants.

Table 8.4 Participants attending the Omineca-Peace SSFM orientation workshop, June 23, 2000.

Name	Licencee/Agency
Bill Jensen	FRBC
Christine Gelowitz	FRBC
Sean Simmons	FRBC
Michelle Van-Sluytman	Fraser Lake Sawmills
Peet Vahi	L&M Lumber Ltd.
Bill LaForge	Vanderhoof IFPA
Janice Thurston	Plateau Sawmills Ltd.
Dick Nakatsu	MoF – Prince George
Norma Stromberg-Jones	MoF – Robson Valley District
Kerry Deschamps	CanFor Ltd.
Doug Wilson	MoELP – Prince George
Beryl Nesbit	MoELP – Prince George
Lynn Blouw	MoELP – Prince George
Susan Salokannel	MoF – Ft.St. James District
Les Herring	MoF – Prince George
Bob Richards	MoF – Prince George District
Norm Fallows	MoF – Vanderhoof District
Diane Reed	MoF – Prince George Region
Steve Dodds	MoF – Mackenzie District

Additional SSFM (and RMP) orientation was provided by the Regional FRBC Planner during meetings with key staff of all forest districts:

Mackenzie	May 5, 2000
Dawson Creek	May 23, 2000
Robson Valley	June 6, 2000
Fort St. James	July 10, 2000
Prince George	July 12, 2000

Vanderhoof	July 31, 2000
Fort Nelson	August 3, 2000
Fort St. John	August 24, 2000

The SSFM guidebook (or draft) was reviewed with planning staff at these meetings, and the RMP and SSFM co-ordinator was confirmed for each district. Recommendations were offered to district staff on how to organise the involvement of local district stakeholders, and the content of the RMP Ground Rules were reviewed. Final planning process decisions were left at the discretion of District SSFM chairs.

Development of SSFM Regional Framework

The Regional Technical Planning Committee met on July 18, 21, and 28 to develop a planning framework for the SSFM RMP. At the first meeting, the committee members met with the Omineca-Peace FRBC Regional Director to establish planning expectations. During subsequent sessions the Terms of Reference was developed, and the planning guidelines of the SSFM guidebook were localised for the Prince George Region. The Terms of Reference for the Committee is presented in Appendix 8.

The Regional Technical Planning Committee developed a frame of reference to guide the planning process of district planning teams. This key document provides a consistent context, content and format for soliciting local SSFM priorities from all 8 management units, and establishes the basis for developing the Regional SSFM RMP. Appendix 8.1 contains an example of the entire frame of reference package for one of the eight forest districts in the region. This package should be reviewed by FRBC investment officers prior to considering the recommendations in this RMP, since the context of the planning exercise must be clearly understood by users of this Resource Management Plan.

The Frame of Reference package was distributed to all SSFM planning chairs in the eight management units on August 2, 2000. The deadline for SSFM issues submissions was set at August 18, 2000, allowing slightly longer than 2 weeks for district planning teams to respond.

Submission of Local SSFM Issues

The narrow time-frame for completion of planning was problematic for most districts. In spite of stakeholder work schedules, submissions were received by August 18 from Vanderhoof, Dawson Creek, Fort St. James Robson Valley and Mackenzie. The deadline for submissions was extended based on individual committee circumstances, and input from all other Districts was received by September 8, thereby completing this phase of the planning process.

8.1.3.2 RANKING OF DISTRICT SSFM ISSUES

The Regional Technical Planning Committee began the task of reviewing and consolidating local issues on August 22-23, and continued the process from 1 to 2 days each week until September 15. The steps of the process are described subsequently

Screening of all SSFM Issues

Initial screening of district submissions began as soon as they were received. In several cases, submissions were returned to district planning teams for modification, clarification, or additional input. This was largely due to the shift from a project oriented RMP to a consideration of root issues. After final review, approximately 5 "issues" received from a variety of sources were discarded for failure to follow the frame of reference instructions. In general, however, submissions were thoughtfully prepared, and of high technical quality. In a few cases, complex issues were "split" by the committee into separate issues. Table 8.5 indicates the number of acceptable issues received from each of 9 sources.

Table 8.5 Distribution of issues by source.

Source	Number of Issues
Prince George District	10
Robson Valley District	15
Vanderhoof District	23
Fort St. James District	12
Mackenzie District	12
Dawson Creek District	11
Fort St. John District	9
Fort Nelson District	12
Regional Issues[45]	12
Total Solicited Issues	116

The Ranking Procedure

Data was transcribed from the issues summaries into an MS ACCESS database. All text and categorical data were archived as submitted, and other regional ranking tables and fields were designed. Keywords were assigned to represent issues and knowledge gaps, as interpreted by the Committee, from the submitted issues summaries. Figure 8.2 describes the database structure. This database was used extensively in the preparation of this document, and will be useful for future years revisions to the SSFM plan.

The Regional Technical Planning Committee developed a 9 criteria issue-rating scheme for use in ranking each issue as submitted. The criteria represent most of the considerations identified in the SSFM Guidebook (page 27 "Considerations for Assessing the Priority of SSFM Issues"), as well as others the committee felt reflected relative investment value. These criteria are described inTable 8.6.

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[45] Issues received from regional headquarters staff of both resource ministries; some were district specific,others were of regional context; all were assigned to the appropriate management units and evaluated with District Planning Team submissions.

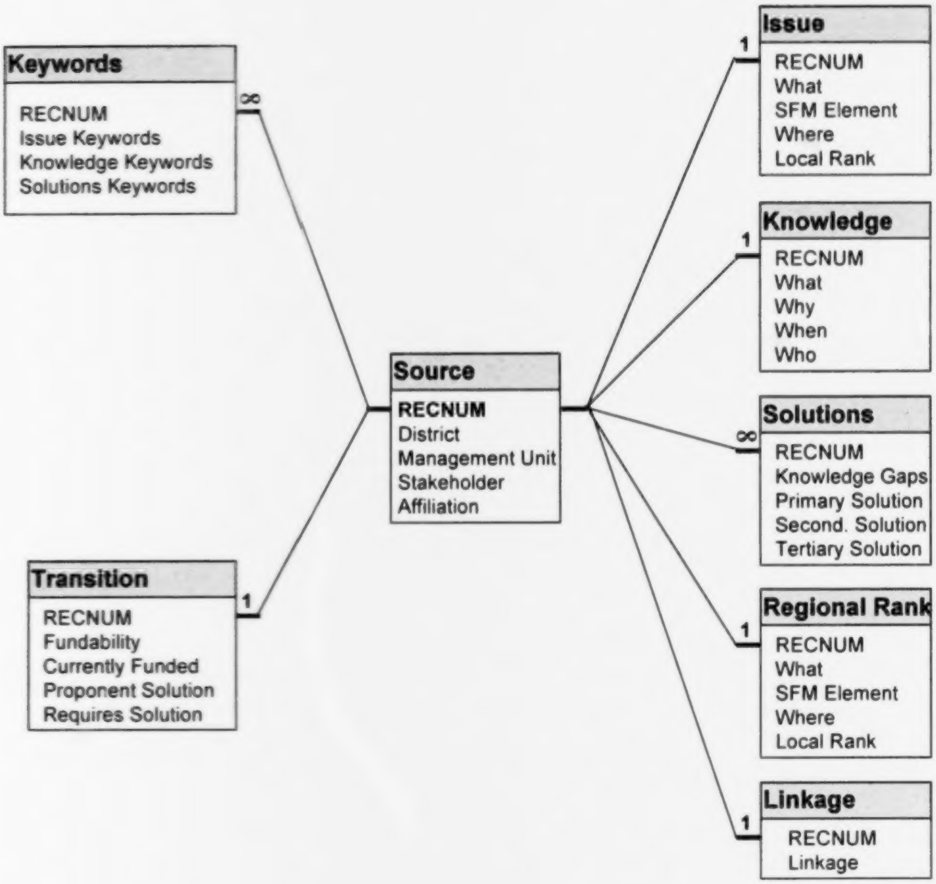
Keywords
RECNUM
Issue Keywords
Knowledge Keywords
Solutions Keywords
∞
Transition
RECNUM
Fundability
Currently Funded
Proponent Solution
Requires Solution
1
Source
RECNUM
District
Management Unit
Stakeholder
Affiliation
1
Issue
RECNUM
What
SFM Element
Where
Local Rank
1
Knowledge
RECNUM
What
Why
When
Who
∞
Solutions
RECNUM
Knowledge Gaps
Primary Solution
Second. Solution
Tertiary Solution
1
Regional Rank
RECNUM
What
SFM Element
Where
Local Rank
1
Linkage
RECNUM
Linkage

Figure 8. Structure of SSFM Issue Database (8 tables; 29 fields).

Committee members reviewed the 116 district issues, and independently assigned a score for criteria 2, 3, 4, 5, 6, 7 and 9. Independent scores were subsequently discussed and adjusted to reflect a committee consensus.

Inter-agency Planning Team members were then consulted to assign a rank to criteria 1. In cases where an IPT member was involved in SSFM issue preparation, an alternate member was consulted.

A keyword search of the database was used to score criteria 8; relative commonality in issues and knowledge gaps determined the score assigned. The regional ranking scores for the 116 issues are presented in Appendix 8.2.

Table 8.6 Regional SSFM Criteria for ranking District Issues.

Criteria: question	Explanation	Score & *Weight
LRMP: how well does the issue relate to high priority issues identified in an approved LRMP?[46]	The LRMP provides comprehensive stakeholder participated, government approved direction, and is an excellent reference source for identified resource issues.	0-5 *2
CCFM: how well does the issue relate to the 6 criteria [47], 22 elements[48] and indicators represented in the Canadian Council of Forest Ministers' report "Sustainable Forests: A Canadian Commitment?	The Canadian Council of Forest Ministers' criteria are an important initiative that is linked to national goals for sustainable forestry certification.	0-5 *2
TSR: how well does the issue relate to timber supply review issues?[49]	Forest level issues identified in the timber supply planning process are strategic in nature, and are considered high in priority to SSFM planning	0-5 *2
Success: will the scope of the issue ensure a high probability of achieving a solution through knowledge investment?	The SSFM issue must be reasonable in scope, permitting any knowledge investments to yield satisfactory and measurable resolution.	0-5 *1
Stakeholders: will knowledge solutions to this issue benefit a variety of stakeholders?	If the issue is too narrowly focused and specific to a single interest it may have limited community benefits. Issue resolving investments should benefit a number of interest or stakeholders.'	0-5 *1
Linkage: is the issue linked to a variety of management disciplines?	Knowledge investment return will be maximised for issues which affect a number of decision-makers, planners, agencies, and stakeholders.	0-5 *1
Policy: does the issue link to (or influence) factors which are driving policy change?	Issues which result in pressure to review or change government policies may be indicative of real, pertinent, current issues. Issues relating to pressures for change may be of importance at various levels of government. Solutions to these issues can provide valuable input for policy change reviewers and decision-makers.	0-5 *1
Commonality: has the issue been identified in other management units?	Issues common to a number of administrative jurisdictions may reflect greater importance. Solutions derived in one jurisdiction that may be extrapolated to other forests increase knowledge investment return.	0-5 *1
Urgency: does the issue reflect an urgent need for resolution and improved decision-making?	A higher priority may be appropriate for those issues which are delaying or preventing important decisions, particularly if it is a recurring issue.	0-5 *1
	Maximum Issue Score	**60**

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[46] All management units in the Prince George Region, except Mackenzie, have completed and approved LRMP's. The Mackenzie plan is currently undergoing final review and ratification.

[47] 1. Conservation of biological diversity; 2. Maintenance and enhancement of forest ecosystem condition and productivity; 3. Conservation of soil and water resources; 4. Forest ecosystem contributions to global ecological cycles; 5. Multiple benefits to society; 6. Accepting society's responsibility for sustainable development.

[48] Ecosystem diversity; Species diversity; Genetic diversity; Disturbance and stress; Ecosystem resilience; Extant biomass; Physical environmental factors; Policy and protection forest factors; Global carbon budget; Forest land conversion; Carbon dioxide conservation; Policy factors; Hydrological cycles; Productive capacity; Competiveness; Contribution to economy; Non-timber values; Aboriginal and treaty rights; Participation by Aboriginal communities; Sustainability of forest communities; Fair and effective decision making; informed decision making.

[49] Documented in: Forest Management Issues Identified Through the AAC Determination Process – TSA/TFL Timber Supply Reviews: 1992:1996. Timber Supply Branch, BC Ministry of Forests, December, 1996.

8.2 KEY REGIONAL SSFM ISSUES

Selection of Key Regional Issues was entirely based on the rankings of individual district submission. A total of 116 individual responses were reviewed by The Technical Planning Committee. These submissions were consolidated where common issues from several sources were received. All issues were priority ranked. Issues ranked in the top 50% were then identified as Key Issues. A total of 14 such Key Issues were identified from the 116 Issue submissions. Each issue is identified below, and throughout the RMP by the following numbering sequence. A brief description of each key issue from a general, regional context follows; investment officers are encouraged to review the District issue summary forms for a complete description of each key issue in its local context.

8.2.1 ISSUE 1 UNRELIABLE FOREST RESOURCE INVENTORIES

A prerequisite to achieving Sustainable Forest Management is an accurate description of the current resource (size,composition, structure, location) and dynamics (rate and direction of change) of core forest resource levels.

SFM objectives and resulting strategies are based on both societal values as well as scientifically based accounting of resource attributes. Some of the core resource levels or data sets are:

- Vegetation;
- Ecology (TEM/PEM);
- Recreation;
- Soils/Surficial Geology;
- Wildlife;
- Topography & Contours; and
- Fisheries.

The first four inventories comprise the focus of Issue 1. The remaining three are addressed as individual key issues.

The vintage of large tracts of timber inventories the Prince George Forest Region is in excess of twenty years. This is problem is most acute in the Ft. Nelson-Peace portion of the region and also in the northern part of the Mackenzie forest management unit. The accuracy and reliability of these inventories makes future projections of timber values uncertain. It is essential that the data sets (both spatial and attribute) are complete and current to support SFM within each management unit. In many cases improving forest resource information represents the single most effective forest management strategy. In particular Vegetation,TEM/PEM and Soil/Surficial Geology data sets can be used to support wildlife management, pest management and biodiversity management objectives.

A scientific approach to quantifying resource values is advocated by the Regional Technical Planning Committee in order to provide statistically valid estimates based on rigorous sampling principles. As public access to resource data and information increases we can expect to be challenged on the reliability and accuracy of the information and the credibility of the management decisions which are based on these inventory data sets.

8.2.2 ISSUE 2 INCOMPLETE CARIBOU MANAGEMENT OBJECTIVES

Caribou manageement is a highly publicised issue in the Prince George Region. Segregation from other "at-risk" species is a function of its perceived higher public value, and more conspicuous response to forest development.

8.2.3 ISSUE 3 LACK OF SPECIES-AT-RISK MANAGEMENT OBJECTIVES

Sustainable Forest Management places great emphasis on the preservation of biodiversity, particularly the conservation of species of plants, animals considered "at risk" from forest development. In the Omineca-Peace Region the following species of animal are generally considered within this category:

- Grizzly bear
- Wolverine
- Fisher
- Arctic Grayling
- Bull Trout
- White Sturgeon
- Various raptors and songbirds

The population and habitat status and dynamics for each of these species has not been completely evaluated, preventing clearly defined and measurable objectives for their preservation and enhancement. Until this knowledge is acquired, SFM principles demand the most cautious and conservative management strategies, which often severely constrain the supply of other forest resources in "at risk" species management zones.

8.2.4 ISSUE 4 LACK OF GENERAL WILDLIFE HABITAT MANAGEMENT OBJECTIVES

The census is incomplete for population and habitat information of wildlife species not currently considered at risk (moose, elk deer, pine marten wolverine and mountain goat). Inadequate or unreliable knowledge prevents the definition of clear and measurable objectives, thereby frustrating effective management planning. Without a means of projecting the future supply of these wildlife species, a management strategy in most forest units is impossible.

8.2.5 ISSUE 5 UNKNOWN NATURAL DISTURBANCE, BIODIVERSITY AND NATURAL SUCCESSIONAL DYNAMICS BENCHMARKS

SFM incorporates forest condition objectives which are intended to mimic the historic patterns of forest disturbance and seral conditions in the landscape. This natural "benchmark" remains a concept; in the Omineca-Peace Region there is still inadequate understanding of the role that natural disturbance plays in shaping the structure of the forest. Our knowledge of successional dynamics for most forest types is incomplete, preventing meaningful habitat projection or biodiversity management strategies.

8.2.6 ISSUE 6 INADEQUATE SUSTAINABLE FOREST MANAGEMENT DECISION SUPPORT TOOLS

Sustainable Forest Management, like ecosystem management, is a structured process of deduction aimed at selecting and implementing the most appropriate management actions for a specific forest estate. Each forest situation is unique; management appropriate for one forest estate may not be suitable in another due to differences in management objectives and forest structure.

SFM has six key elements:

- *Forest management objectives are clearly expressed in measurable terms.(objectives).* Desired products, services, amenities and uses must be defined for a specific forest area, and which, collectively, define forest management objectives. The supply of these objectives must be specified in time, space, quantity and quality in order to define the forest structure that must be achieved by management. Forest level objectives and public forest policies must be attainable, given initial forest structural limitations and reasonable management expectations, otherwise forest management will fail.

- *The forest management problem is analysed, and a strategic solution is designed.(strategy).* The dynamics of the forest must be analysed to determine if resource supply limitations prevent the attainment of forest management objectives. This analysis specifies the forest management problem, and may identify management opportunities to resolve it. Depending on the opportunities available, one or more forest management strategy is designed and evaluated. Forest management strategic analysis requires an integrated forest information system which describes stand conditions and locations, specifies forest resource values, provides a reliable method of projecting stand dynamics, and a means of forecasting the dynamics of the entire forest estate.

- *Stand level tactics are designed (tactics).* Within the context of the management strategy, a tactical analysis must be conducted to select the most appropriate stand level silvicultural interventions based on biological effectiveness, economic efficiency, and social acceptability.

- *The forest management program is developed to implement tactics and strategy (program).* An implementation schedule is prepared which identifies what interventions will occur at which locations in the forest, and at what time. The schedule is then implemented operationally, based on the availability of forest management funds.

- *The program management program is implemented in the forest.* Forest management must actually be implemented in the forest. The actual stand level results of silvicultural interventions are measured against stand projections, and the cumulative effects of all interventions on forest dynamics are evaluated against management forecasts. Periodically tactical, or strategic changes may be required to ensure the achievement of forest-level objectives.

- *The stand and forest response is evaluated and forest management performance is periodically reviewed and revised.* Actual stand level responses, and cumulative forest level effects must be compared with projections and forecasts. Also, forest level values, objectives and government policies change over time. Forest management direction should be revised periodically to remain in step with any changes that affect management strategy.

The absence of any of these key elements seriously limits the chance of Sustainable Forest Management success. Forest management decision-making throughout the Omineca-Peace Region currently falls far short of this model of SFM, and reflects the following characteristics:

- A set of harvest and silvicultural interventions are identified which support an acceptable level of timber production from the forest;

- interventions are gradually implemented, along with pertinent operating regulations and constraints;

- there are no stated forest objectives with which a basis for evaluating forest level response;

- no forest level feedback control exists, since management is not focused on achieving a specified forest structure or condition.

8.2.7 ISSUE 7 INCOMPLETE FISH AND FISH HABITAT MANAGEMENT OBJECTIVES

This issue is similar in nature to Issue 4, but focussed on the inadequate census of general fisheries and riparian habitat resource values.

8.2.8 ISSUE 8 INCOMPLETE UNDERSTANDING OF BOREAL MIXEDWOOD STAND DYNAMICS AND MANAGEMENT OBJECTIVES

Without a thorough understanding of the inter-specific dynamics of Boreal conifer-broadleaf mixtures (predominantly white spruce/trembling aspen), projection of stand and forest dynamics is not possible throughout much of the northern third of the region, and parts of the Sub-boreal forest. Sustainable Forest Management depends on the biological realism, and precision of forest analysis, which in turn depends on the user's silvicultural knowledge and experience in the forest under analysis, and the accuracy with which stand responses can be predicted.

Currently in the Boreal Mixedwood, knowledge of the effects of silviculture and forest management decisions are uncertain, both from a biological and socio-economic perspective.

8.2.9 ISSUE 9 LACK OF SPECIFIC PEST MANAGEMENT DECISION SUPPORT TOOLS

This issue is similar in nature to Issue 5, but from the perspective of decisions regarding forest bark beetle species (Mountain pine beetle, spruce ark beetle, Balsam bark beetle) affecting mature and older immature stands, as well as Lodgepole pine stem rust species, affecting younger stands. The focus of this issue is currently in the Vanderhoof supply block, but applies equally to the Fort St. James supply block and the Mackenzie TSA.

8.2.10 ISSUE 10 INADEQUATE OR INACCURATE SPATIAL RESOURCE BASE MAPS

This issue is similar to Issue 1, but relates to a major strategy currently being implemented (TRIM II). The TRIM II program provides updated topographic maps showing accurate locations of roads, landings, seismic lines. TRIM II provides improved resolution and accuracy in capturing the presence of smaller streams and topographic contours. Digital orthophotos are also provided by the program; orthophotos can be used as a landscape view in support of maps and other thematic products generated from photointerpretation.

The TRIM II Base Map is designated as the "common" base map in the PG Forest Region for registering resource data. This policy, supported by major licencees (forest industry) and government agencies, ensures efficient electronic exchange and sharing of spatial data.

The Technical Planning Committee advocates completion of the TRIM II program as an important keystone technology for addressing Sustainable Forest Management resource issues

8.2.11 ISSUE 11 LACK OF ALTERNATIVE HARVESTING EXPERIENCE

The use of alternative harvesting methods is considered to be a potentially valuable solution to the spatial harvesting constraints inherent in Sustainable Forest Management practices. This assumption is essentially untested, save for very limited scale implementation of research demonstrations. Without wider scale implementation and adaptive management experience, alternative harvesting assumptions may fail. This issue is currently most acute in the Fort St.James and Robson Valley management units, but applies to parts of all units across the region.

8.2.12 ISSUE 12 LACK OF ARCHAEOLOGICAL VALUE AND PRESERVATION OBJECTIVES

This issue is similar in nature to Issue 1, but from a specific value perspective. Without an accurate and reliable archaeological resource inventory in all management units, it is difficult to determine societal values and objectives

8.2.13 ISSUE 13 INCOMPLETE VISUAL SENSITIVITY OBJECTIVES

(See Issue 12). Without an accurate and reliable inventory of sensitive visual landscape features in all management units, it is difficult to determine societal values and objectives.

8.2.14 ISSUE 14 INADEQUATE UNDERSTANDING OF MANAGED STAND SITE PRODUCTIVITY POTENTIAL

Site productivity potential is a key element in the projection of stand dynamics and yield across the entire region. Without an accurate means of projecting stand, and ultimately forest growth, the supply of forest values cannot be determined, meaningful and efficient SFM management strategies are not possible.

8.3 KNOWLEDGE STRATEGY

The Regional Technical Planning Committee met with the FRBC Director of Omineca-Peace Region on September 18, 2000 to discuss her expectations of the SSFM RMP. A mutual agreement was reached whereby the Committee would produce, by September 30, an interim report containing the following information:

- Source Documentation of the planning process to date.
- Identification of Key Regional Issues
- "First Approximation" Strategic Knowledge Investment Projects, by management unit, to a total regional investment of approx. 15 to 18 M.

This information is expected to be adequate for the purpose of developing the draft Forest Renewal Investment Plan during October. During October, the Regional Technical Committee agreed to consult further with the following technical specialists (see Table 8.7 below) to refine the project descriptions, timing and investment levels. Following this refinement phase tactical planning via Tactical Working Groups is proposed (see Section 8.5).

Table 8.7 Regional Technical Planning Committee and technical advisors.

Committee Member (designated alternate)	Support Specialist	Discipline	Manager (section head)
D. Nakatsu (D. Maloney)			L. Currie
	B. Schweitzer	Land Use Planning	L. Currie
	J. Pousette	Timber Supply	L. Currie
	M. Makar	Inventory	L. Currie (D. Nakatsu)

	D. Reed	Recreation	L. Currie (D. Nakatsu)
	L. Roberge	Landscape	L. Currie
	L. Badowski	G/Y	L. Currie (D. Nakatsu)
	S. Taylor	Silviculture	W. Martin
	D. Maloney	Research	W. Martin (S. Taylor)
B. Nesbit (L. Blouw)			J. Metcalfe
	L. Blouw	Fisheries	J. Metcalfe (D. Cadden)
	J. McInnes	Fisheries	J. Metcalfe (D. Cadden)
	B. Anderson	Fisheries	J. Metcalfe (D. Cadden)
	D. Heard	Wildlife	J. Metcalfe
	B. Arthur	Habitat	J. Metcalfe (C. Ritchie)
	A. Wei	Hydrology	D. Zirul
	B. Carmichael	Water Quality	R. Girard (D. Sutherland)
D. Adamson			
K. Deschamps			

A total of 32 Key Knowledge Investment Strategies were developed. They are described subsequently, grouped by parent issues

8.3.1 STRATEGIES TO RESOLVE UNRELIABLE FOREST RESOURCE INVENTORIES

8.3.1.1 STRATEGY A "STATE OF RESOURCE INVENTORIES"

This knowledge investment strategy consists of an immediate consolidation of all known resource inventory information within each management unit with the dual objective of making known information available, and evaluating it's accuracy and reliability. An output of this project is a strategic plan for enhancing inadequate information. This project is to be repeated annually in each TSA to maintain the most current and useful resource database possible.

8.3.1.2 STRATEGY B FIELD INVENTORY ENHANCEMENT

This investment strategy is initiated with Strategy A; investment by management unit is based on known inventory priorities in 2000. Investment emphasis is recommended for Fort Nelson, Fort St. John and Dawson Creek in view of the more serious state of timber emphasis inventories in these districts. A similar emphasis is recommended for the Vanderhoof supply block to support the IFPA initiative there.

8.3.2 STRATEGIES TO RESOLVE INCOMPLETE CARIBOU MANAGEMENT OBJECTIVES

8.3.2.1 STRATEGY A CARIBOU "STATE OF KNOWLEDGE"

The multi-unit projects of this investment strategy are similar in concept to 1A above, but focused on consolidating, organising and extending all known information for Caribou subspecies in 6 of the 8 Forest Districts. An output of this project is a strategic plan for the collection of key, missing information. It is strongly recommended that an investment co-ordinating committee be struck, made up of representative participants from each management unit. This committee would develop a strategic investment plan aimed at maximising investment efficiency between adjacent, or similar management units.

8.3.2.2 STRATEGY B CARIBOU GAP INVENTORY

This investment strategy is initiated by Strategy A. The complexity and scale of effort to address this issue requires a substantial investment directed to the six management units deemed to benefit the most from the initiative. Investments in 2001 are recommended in view of existing needs as well as previous and ongoing projects. Constant investment levels are recommended for three years, as a result of strategic direction from Strategy A.

8.3.2.3 STRATEGY C CARIBOU MANAGEMENT DECISION MODEL DEVELOPMENT

This strategy is a research and development investment aimed at developing a Caribou habitat/population projection model for use in strategic and tactical planning. An inter-management unit project management committee is recommended. Investments to serve the needs of all management units is recommended to begin in 2003 in view of the improved data and information status expected by that date.

8.3.3 STRATEGIES TO RESOLVE LACK OF SPECIES-AT-RISK MANAGEMENT OBJECTIVES

8.3.3.1 STRATEGY A SPECIES RISK "STATE OF KNOWLEDGE"

The multi-unit projects of this investment strategy are similar in concept to 1A above, but focused on consolidating, organising and extending all known information for plant and animal species known or assumed to be currently "at risk" within each management unit. An output of this project is a strategic plan for the collection of key, missing information. It is strongly recommended that an investment co-ordinating committee be struck, made up of representative participants from each management unit. This committee would develop a strategic investment plan aimed at maximising investment efficiency between adjacent, or similar management units.

8.3.3.2 STRATEGY B SPECIES AT RISK GAP INVENTORY

This investment strategy is initiated by Strategy A. The complexity and scale of effort to address this issue requires a substantial investment in all management units over the next five years. Investments in 2001 are recommended in view of existing needs as well as previous and ongoing projects. Investment levels are recommended to rise for the remaining four years as a result of strategic direction from Strategy A.

8.3.3.3 STRATEGY C SPECIES AT RISK PROJECTION MODEL DEVELOPMENT

This strategy is a research and development investment aimed at developing a habitat/population projection model for use in strategic and tactical planning. An inter-management unit project management committee is recommended. Investments to serve the needs of all management units is recommended to begin in 2003 in view of the improved data and information status expected by that date.

8.3.4 STRATEGIES TO RESOLVE LACK OF GENERAL WILDLIFE HABITAT MANAGEMENT OBJECTIVES

8.3.4.1 STRATEGY A WILDLIFE HABITAT "STATE OF KNOWLEDGE"

This strategy is intended to assemble, organise and extend all available knowledge and information concerning wildlife species currently considered not at risk in the region. An management unit common output of this investment is identification of key information gaps concerning species or habitat types. Inter-management unit co-operation is recommended to ensure compatible, efficient knowledge investments across unit boundaries. The scope and complexity of this project will require a phased investment over the period 2001-2004.

8.3.4.2 STRATEGY B WILDLIFE HABITAT GAP INVENTORY

This multi-unit investment projects of this strategy is linked to the outcome of Strategy A. Start-up in 2001 reflects already known information gaps. An acceleration of investment over the remaining four years is recommended as strategic priorities become clarified through Strategy A

8.3.4.3 STRATEGY C WILDLIFE HABITAT DECISION MODEL

This knowledge investment should provide an integrated decision system capable of utilising existing and new information, and to further provincial habitat supply modelling initiatives begun in 2000. Local investments are recommended for 2003, in order to capitalise on this pioneering work, and recognising the need for local validation and calibration to Omineca-Peace conditions.

8.3.5 STRATEGIES TO RESOLVE UNKNOWN NATURAL DISTURBANCE, BIODIVERSITY AND NATURAL SUCCESSIONAL DYNAMICS BENCHMARKS

8.3.5.1 STRATEGY A NATURAL DISTURBANCE PROBLEM ANALYSIS

This strategy serves as a research and development problem analysis of the issue. Inter-management unit co-operation is recommended to ensure compatible, efficient knowledge investments across unit boundaries. This project should remain a "local initiative" to ensure continuity between problem analysis and Strategy B, and recognition of the local (geographic, forest type and disturbance origin) nature of the issue. An output of this project is a management unit specific tactical plan for Strategy B.

8.3.5.2 STRATEGY B NATURAL DISTURBANCE LOCAL DATA COLLECTION

The data collection projects of this strategy should be undertaken beginning in 2002 in all management units to reflect the geographic variation in forest types and natural disturbance regimes. The workplans for these of projects must be based on the strategic direction indicated through Strategy A.

8.3.6 STRATEGY TO RESOLVE INADEQUATE SUSTAINABLE FOREST MANAGEMENT DECISION SUPPORT TOOLS

8.3.6.1 STRATEGY A SUSTAINABLE FOREST MANAGEMENT DECISION SUPPORT

The complexity and scope of the issue, and slow progress to date demand a sizeable investment over the next four years. The expected likelihood of successful issue resolution is moderate, at best, although the potential benefits of doing so are enormous. Initially the project is envisioned as a problem analysis intended to more adequately define the nature of the problem. A useful output of this phase is expected to be an extension initiative to improve the understanding of decision makers throughout the region. The issue demands a consistent, provincial strategy, thereby requiring an inter-regional initiative. It is recommended that participating management unit stakeholders strike a project management committee before project budgets are finalised.

8.3.7 STRATEGIES TO RESOLVE INCOMPLETE FISH AND FISH HABITAT OBJECTIVES

8.3.7.1 STRATEGY A FISH/FISH HABITAT "STATE OF KNOWLEDGE"

See Issue 4 for the approach recommended for this strategy.

8.3.7.2 STRATEGY B FISH/FISH HABITAT GAP INVENTORY

See Issue 4 for the approach recommended for this strategy.

8.3.7.3 STRATEGY C FISH/FISH HABITAT MODELLING

See Issue 4 for the approach recommended for this strategy.

8.3.8 STRATEGIES TO RESOLVE INCOMPLETE UNDERSTANDING OF MIXEDWOOD STAND DYNAMICS AND MANAGEMENT OBJECTIVES

8.3.8.1 STRATEGY A MIXEDWOOD "STATE OF KNOWLEDGE"

This strategic investment is recommended as a benchmark information assembly and extension exercise. The investment focus is the white spruce/trembling aspen stratified mixtures of the Peace River and Fort Nelson Districts. The national scope of this issue demands assembly of extensive knowledge and information from a wide range of Boreal forest jurisdictions, requiring a sizeable multi-year investment. A second year output of this project should be a decision-makers-conference. It is strongly recommended that existing inter-district stakeholders strike a project committee to ensure efficient

8.3.8.2 STRATEGY B MIXEDWOOD PROBLEM ANALYSIS/LOCAL RESEARCH

This strategy is, by its nature, a conventional research investment. The Regional Technical Planning Committee strongly recommends, however, that it remain a local initiative, rather than a headquarters investment. This approach will maximise the local benefits of this geographically specific regional issue.

8.3.8.3 STRATEGY C MIXEDWOOD MODEL DEVELOPMENT AND EXTENSION

This strategy also involves an R&D investment, and should capitalise on investments to date in existing models, as well as encourage the development of new decision systems.

It is recommended that northern districts consolidate the recommended investment during the first two and final years of the plan to reflect R&D economies of scale.

8.3.9 STRATEGY TO RESOLVE LACK OF PEST MANAGEMENT DECISION TOOLS

8.3.9.1 STRATEGY A PEST MANAGEMENT DECISION TOOL DEVELOPMENT

This strategy should be focussed in Vanderhoof due to the expected portability of the resulting knowledge to other districts. The Regional Technical Planning Committee expect that a modest two year investment will yield useful decision tool products for bark beetle and rust incidence maps, as well as silvicultural expert systems.

8.3.10 STRATEGY TO RESOLVE INADEQUATE OR INACCURATE SPATIAL RESOURCE BASEMAPS

8.3.10.1 STRATEGY A TRIM II AND ORTHOPHOTO PROJECT COMPLETION

The Regional Technical Planning Committee strongly recommend the completion of the TRIM II project investment over the next two years.

8.3.11 STRATEGIES TO RESOLVE LACK OF ALTERNATIVE HARVESTING EXPERIENCE

8.3.11.1 STRATEGY A ALTERNATIVE HARVESTING "STATE OF KNOWLEDGE"

This strategy focuses investment in the two management units likely to benefit the most from a "State of the Art" analysis. This investment will complement the EFMPP strategy currently underway. The portability of knowledge and information to other management units is expected to be large.

8.3.11.2 STRATEGY B ALTERNATIVE HARVESTING LOCAL TRIALS

This strategy involves implementing operational trial/technical demonstration investments in several districts. aimed at increasing practical understanding of the issue in a reasonable period of time. The project should be implemented in all Sub Boreal management units, as well as the montane portions of the South Peace River. Investments are recommended for the second through fifth years of the plan, to take advantage of strategic direction resulting from Strategy A

8.3.11.3 STRATEGY C ALTERNATIVE HARVESTING OPERATIONAL MONITORING

The Regional Technical Planning Committee anticipate the need for operational monitoring of alternative harvesting systems experience throughout the region if these systems become more commonly utilised over the next five years. The strategy involves potential modest investment in all districts in the final year of the plan. The expected likelihood of success is low.

8.3.12 STRATEGIES TO RESOLVE LACK OF ARCHAEOLOGICAL VALUE PRESERVATION OBJECTIVES

8.3.12.1 STRATEGY A ARCHAEOLOGICAL VALUES PROBLEM ANALYSIS

This strategy serves as a problem (issue) analysis, with the objective of developing a resolution strategy for this comlex sociological issue. The Committee recommend that an inter-management unit project committee be struck, to consolidate effort, funds and maximise common benefits.

8.3.12.2 STRATEGY B ARCHAEOLOGICAL VALUES FIELD INVENTORY

This strategy is initially driven by known features gaps in all management units in 2001/2002, and subsequently by direction from Strategy A for the remaining two years. The expected likelihood of issue resolution is no better than moderate.

8.3.12.3 STRATEGY C ARCHAEOLOGICAL VALUES DECISION TOOLS DEVELOPMENT

This strategy is aimed at developing any expert-system suitable for management decision support. Investment is recommended in all units during the third year of the plan. An inter-unit project management committee is recommended.

8.3.13 STRATEGIES TO RESOLVE INADEQUATE VISUAL SENSITIVITY OBJECTIVES

8.3.13.1 STRATEGY A VISUAL SENSITIVITY "STATE OF KNOWLEDGE"

This strategy is similar in nature to Issue 12/Strategy A)

8.3.13.2 STRATEGY B VISUAL SENSITIVITY FIELD INVENTORY

This strategy aims to accelerate and conclude visual landscape inventories in all management units by 2003.

8.3.14 STRATEGIES TO RESOLVEINADEQUATE UNDERSTANDING OF MANAGED STAND SITE PRODUCTIVITY POTENTIAL

8.3.14.1 STRATEGY A SITE PRODUCTIVITY "STATE OF KNOWLEDGE"

This strategy is aimed at consolidating, organising and extending all local knowledge and information concerning site productivity potential for timber production. The Committee recommend an inter-unit project management committee be struck in order to optimise on common sub issues. An output of this strategy is a tactical plan for improving the state of knowledge, in Strategy B.

8.3.14.2 STRATEGY B SITE PRODUCTIVITY GAP RESEARCH

This is a growth and yield core research strategy, in addition to a local data collection initiative. An inter-unit committee should determine, during 2001, common research approaches to resolve knowledge gaps (in SIBEC, OGSI Growth Intercepts, and others). Subsequent data collection in years two and three should be aimed at resolving the greater issue within each unit.

8.4 REGIONAL SUMMARY OF RECOMMENDATIONS

8.4.1 REGIONAL SUMMARY TABLE

The knowledge investment recommendations of the Regional Technical Planning Committee are presented in Tables 8.8a and b, summarised by issue, management unit, and fiscal year of the five year plan.

This information is also summarised for the region, by issue, in Figures 8.3 and 8.4. Table 8.9 presents the knowledge investment profile for each year of the five year RMP, for each management unit. Figure 8.5 also summarises the total SSFM investment for 2001/2002, by management unit.

Table 8.8 a) Knowledge Investment Project Table for Key Omineca-Peace SSFM Issues

Issue ID	Issue Description	Knowledge Strategy	Knowledge Investment Project	MU	Status	Investment Type	Rank	Type of Benefit	Scope	Timing	Utility	Success
1	Unreliable forest resource inventory	A	VRI State of Inventory	Dfn	N	E	1a	T and NT	1 MU	S	TSR, LRMP, CCFM	H
				Djo	N	E	3a	T and NT	1 MU	S	TSR, LRMP, CCFM	H
				Ddc	N	E	4a	T and NT	1 MU	S	TSR, LRMP, CCFM	H
				Dpg	N	E	7a	T and NT	1 MU	S	TSR, LRMP, CCFM	H
				Dva	N	E	11a	Tand NT	1 MU	S	TSR, LRMP, CCFM	H
				Dmk	N	E	15a	T and NT	1 MU	S	TSR, LRMP, CCFM	H
				Drv	N	E	40a	T and NT	1 MU	S	TSR, LRMP, CCFM	H
				Dja	N	E	1a	T and NT	1 MU	S	TSR, LRMP, CCFM	H
		B	VRI Field Inventory	Dfn	E	N	1b	T and NT	1 MU	S	TSR, LRMP, CCFM	H
				Djo	E	N	3b	T and NT	1 MU	S	TSR, LRMP, CCFM	H
				Ddc	E	N	4b	T and NT	1 MU	S	TSR, LRMP, CCFM	H
				Dpg	E	N	7b	T and NT	1 MU	S	TSR, LRMP, CCFM	H
				Dva	E	N	11b	T and NT	1 MU	S	TSR, LRMP, CCFM	H
				Dmk	N	N	15b	T and NT	1 MU	S	TSR, LRMP, CCFM	H
				Drv	E	N	40b	T and NT	1 MU	S	TSR, LRMP, CCFM	H
2	Incomplete Caribou management objectives	A	Caribou State of Knowledge	Dva	N	E	2a	NT	6 MU's	S	TSR, LRMP, CCFM	H
				Dfn	N	E	5a	NT	6 MU's	S	TSR, LRMP, CCFM	H
				Dja	N	E	6a	NT	6 MU's	S	TSR, LRMP, CCFM	H
				Dpg	N	E	9a	NT	6 MU's	S	TSR, LRMP, CCFM	H
				Dmk	N	E	12a	NT	6 MU's	S	TSR, LRMP, CCFM	H
				Ddc	N	E	20a	NT	6 MU's	S	TSR, LRMP, CCFM	H
		B	Caribou Gap Inventory	Dva	N	N	2b	NT	6 MU's	S	TSR, LRMP, CCFM	M
				Dfn	N	N	5b	NT	6 MU's	S	TSR, LRMP, CCFM	M
				Dja	E	N	6b	NT	6 MU's	S	TSR, LRMP, CCFM	M
				Dpg	N	D	2b	NT	6 MU's	S	TSR, LRMP, CCFM	M
				Dmk	E	N	12b	NT	6 MU's	S	TSR, LRMP, CCFM	M
				Ddc	N	N	20b	NT	6 MU's	S	TSR, LRMP, CCFM	M

		C	Caribou Decision Model Development	All	N	U	2c	NT	6 MU's	S	TSR, LRMP, CCFM	M
3	Lack of species- at- risk man. objectives	A	Species at Risk State of Knowledge	All	N	E	8a	NT	8 MU's	S	TSR, LRMP, CCFM	H
		B	Species at Risk Gap Inventory	All	N	N	8b	NT	8 MU's	S to L	TSR, LRMP, CCFM	H
		C	Species at Risk Model Development	All	N	U	8c	T and NT	8 MU's	S	TSR, LRMP, CCFM	H
4	Lack of wildlife habitat objectives	A	Wildlife Habitat State of Knowledge	All	N	E	9a	NT	8 MU's	S	LRMP, CCFM	H
		B	Wildlife Habitat Gap Inventory	All	N/E	N	9b	NT	8 MU's	S to L	LRMP, CCFM	H
		C	Wildlife Habitat Decision Model Development	All	N	N	9c	T and NT	8 MU's	S	TSR, LRMP, CCFM	H
5	Unknown biodiv. natural disturbance, successional dynamics benchmarks	A	Natural Disturbance Problem Analysis	All	N	E/U	10a	T and NT	8 MU's	S	LRMP, CCFM	H
		B	Natural Disturbance Local Data Collection	All	N	U/N	10b	T and NT	8 MU's	S	LRMP, CCFM	H
6	Inadequate SFM decision support tools	A	SFM Decision Tools Development	All	N/E	U	17	T and NT	2 MU's	S	TSR, LRMP, CCFM	M

7	Incomplete fish and fish habitat objectives	A	Fish/Fish Habitat State of Knowledge	All	N	E	28a	N/T	8 MU's	S	TSR, LRMP, CCFM	H
		B	Fish/Fish Habitat Gap Inventory	All	N/E	D	28b	N/T	8 MU's	S	LRMP, CCFM	H
		C	Fish/Fish Habitat Model Development	All	N	U	28c	T/NT	8 MU's	S	TSR, LRMP, CCFM	H
8	Incomplete understanding of mixedwoods stand dynamics & management objectives	A	Mixedwood State of Knowledge	Ddc, Djo, Dfn	N	E	19a	T	3 MU's	S	TSR, LRMP, CCFM	H
		B	Mixedwood Problem Analysis/Local Research	Ddc, Djo, Dfn	N/E	U	19b	T	3 MU's	S	TSR, LRMP, CCFM	H
		C	Mixedwood Model Development	Ddc, Djo, Dfn	N/E	U	19c	T	3 MU's	S	TSR, LRMP, CCFM	H
9	Lack of pest management decision tools	A	Pest Management Decision Tool Development	Dva	N/E	U	24	T	8 MU's	S	TSR, LRMP, CCFM	H
10	Inadequate or inaccurate spatial resource basemaps	A	TRIM II	All	N/E	U	27	T/NT	MU's	S	TSR, LRMP, CCFM	H
11	Lack of alternative harvesting experience	A	Alternative Harvesting State of Knowledge	Drv, Dja	N	E	32a	T	8 MU's	S	LRMP, CCFM	H

		B	Alternative Harvesting Local Trials	Drv, Ddc, Dja, Dpg, Dmk Dva	N/E	U	32b	T/NT	8 MU's	S/L	TSR, LRMP, CCFM	M
		C	Alternative Harvesting Monitoring	All	N	N	32c	T/NT	8 MU's	L	TSR, LRMP, CCFM	L
12	Lack of archeological value preservation objectives	A	Archeological Values Problem Analysis	All	N	E/N	36a	NT	8 MU's	S	TSR, LRMP, CCFM	H
		B	Archeological Values Field Inventory	All	N	N	36b	NT	8 MU's	S/L	TSR, LRMP, CCFM	M
		C	Archeological Values Decision Tools Development	All	N	U	36c	NT	8 MU's	S	TSR, LRMP, CCFM	M
13	Incomplete visual sensitivity objectives	A	Visual Sensitivity Field Inventory	All	N	N	37a	NT	8 MU's	S	TSR, LRMP, CCFM	H
		B	Visual Sensitivity State of Knowledge	All	N	E	37b	NT	8 MU's	S	TSR, LRMP, CCFM	H
14	Inadequate understanding of managed stand site productivity potential	A	Site Productivity State of Knowledge	All	N	E	54a	T	8 MU's	S	TSR, LRMP, CCFM	H
		B	Site Productivity Gap Research	All	N	N	54b	T	8 MU's	S	TSR, LRMP, CCFM	H

Table 8.8 b) Knowledge Investment Project Table for Key Omineca-Peace SSFM Issues

Issue ID	Strat. #	Project Name	MU	Regional Rank	Funding Source	Timing	2001/02 ($000)	2002/03 ($000)	2003/04 ($000	2004/05 ($000)	2005/06 ($000)	Total ($000)
1	A	VRI State of Inventory	Dfn	1a	RIP	2001-2006	75	10	10	10	10	115
		VRI State of Inventory	Djo	3a	RIP	2001-2006	75	10	10	10	10	115
		VRI State of Inventory	Ddc	4a	RIP	2001-2006	75	10	10	10	10	115
		VRI State of Inventory	Dpg	7a	RIP	2001-2006	75	10	10	10	10	115
		VRI State of Inventory	Dva	11a	RIP	2001-2006	75	10	10	10	10	115
		VRI State of Inventory	Dmk	15a	RIP	2001-2006	75	10	10	10	10	115
		VRI State of Inventory	Drv	40a	RIP	2001-2006	75	10	10	10	10	115
		VRI State of Inventory	Dja	1a	RIP	2001-2006	75	10	10	10	10	115
		Recommended Investment Totals					600	80	80	80	80	920
	B	VRI Field Inventory	Dfn	1b	RIP, MoF base	2001-2005	1250	1000	500	500	0	3000
		VRI Field Inventory	Djo	3b	RIP, MoF base	2001-2006	1000	750	750	500	500	3150
		VRI Field Inventory	Ddc	4b	RIP, MoF base	2001-2003	350	250	0	0	0	500
		VRI Field Inventory	Dpg	7b	RIP, MoF base	2001-2004	150	100	100	0	0	300

		VRI Field Inventory	Dva	11b	RIP, IFPA	2001-2003	600	250	0	0	0	750
		VRI Field Inventory	Dmk	15b	RIP	2001-2005	75	500	500	500	0	1550
		VRI Field Inventory	Drv	40b	RIP, MoF base	2002-2004	0	250	250	0	0	500
		Recommended Investment Totals					3425	3100	2100	1500	500	9750
2	A	Caribou State of Knowledge	Dva	2a	RIP	2001-2002	50	0	0	0	0	50
		Caribou State of Knowledge	Dfn	5a	RIP	2001-2002	50	0	0	0	0	50
		Caribou State of Knowledge	Dja	6a	RIP	2001-2002	100	0	0	0	0	100
		Caribou State of Knowledge	Dpg	9a	RIP	2001-2002	50	0	0	0	0	50
		Caribou State of Knowledge	Dmk	12a	RIP	2001-2002	50	0	0	0	0	50
		Caribou State of Knowledge	Ddc	20a	RIP	2001-2002	50	0	0	0	0	50
		Recommended Investment Totals					350	0	0	0	0	350
	B	Caribou Gap Inventory	Dva	2b	RIP	2001-2004	100	100	100	0	0	300
		Caribou Gap Inventory	Dfn	5b	RIP, CLUPE	2001-2004	100	100	100	0	0	300
		Caribou Gap Inventory	Dja	6b	RIP	2001-2004	100	100	100	0	0	300
		Caribou Gap Inventory	Dpg	2b	RIP	2001-2004	100	100	100			300
		Caribou Gap Inventory	Dmk	12b	RIP	2001-2004	100	100	100	0	0	300

		Caribou Gap Inventory	Ddc	20b	RIP	2001-2004	100	100	100	0	0	300
		Recommended Investment Totals					600	600	600	0	0	1800
	C	Caribou Decision Model Development	Dpg	2c	RIP	2004-2006	0	0	0	10	35	45
		Caribou Decision Model Development	Drv	2c	RIP	2004-2006	0	0	0	10	35	45
		Caribou Decision Model Development	Dva	2c	RIP	2004-2006	0	0	0	10	35	45
		Caribou Decision Model Development	Dja	2c	RIP	2004-2006	0	0	0	10	35	45
		Caribou Decision Model Development	Dmk	2c	RIP	2004-2006	0	0	0	10	35	45
		Caribou Decision Model Development	Ddc	2c	RIP	2004-2006	0	0	0	10	35	45
		Caribou Decision Model Development	Djo	2c	RIP	2004-2006	0	0	0	10	35	45
		Caribou Decision Model Development	Dfn	2c	RIP	2004-2006	0	0	0	10	35	45
		Recommended Investment Totals					0	0	0	80	280	360
3	A	Species at Risk State of Knowledge	Dpg	8a	RIP	2001-2002	20	0	0	0	0	20
		Species at Risk State of Knowledge	Drv	8a	RIP	2001-2002	20	0	0	0	0	20
		Species at Risk State of Knowledge	Dva	8a	RIP	2001-2002	20	0	0	0	0	20
		Species at Risk State of Knowledge	Dja	8a	RIP	2001-2002	20	0	0	0	0	20
		Species at Risk State of Knowledge	Dmk	8a	RIP	2001-2002	20	0	0	0	0	20

		Species at Risk State of Knowledge	Ddc	8a	RIP	2001-2002	20	0	0	0	0	20
		Species at Risk State of Knowledge	Djo	8a	RIP	2001-2002	20	0	0	0	0	20
		Species at Risk State of Knowledge	Dfn	8a	RIP	2001-2002	20	0	0	0	0	20
		Recommended Investment Totals					160	0	0	0	0	160
	B	Species at Risk Gap Inventory	Dpg	8b	RIP	2001-2006	200	400	400	400	400	1800
		Species at Risk Gap Inventory	Drv	8b	RIP	2001-2006	200	400	400	400	400	1800
		Species at Risk Gap Inventory	Dva	8b	RIP	2001-2006	200	400	400	400	400	1800
		Species at Risk Gap Inventory	Dja	8b	RIP	2001-2006	200	400	400	400	400	1800
		Species at Risk Gap Inventory	Dmk	8b	RIP	2001-2006	200	400	400	400	400	1800
		Species at Risk Gap Inventory	Ddc	8b	RIP	2001-2006	200	400	400	400	400	1800
		Species at Risk Gap Inventory	Djo	8b	RIP	2001-2006	200	400	400	400	400	1800
		Species at Risk Gap Inventory	Dfn	8b	RIP	2001-2006	200	400	400	400	400	1800
		Recommended Investment Totals					1600	3200	3200	3200	3200	14400
	C	Species at Risk Model Development	Dpg	8c	RIP	2003-2006	0	0	40	40	40	120
		Species at Risk Model Development	Drv	8c	RIP	2003-2006	0	0	40	40	40	120
		Species at Risk Model Development	Dva	8c	RIP	2003-2006	0	0	40	40	40	120

		Species at Risk Model Development	Dja	8c	RIP	2003-2006	0	0	40	40	40	120
		Species at Risk Model Development	Dmk	8c	RIP	2003-2006	0	0	40	40	40	120
		Species at Risk Model Development	Ddc	8c	RIP	2003-2006	0	0	40	40	40	120
		Species at Risk Model Development	Djo	8c	RIP	2003-2006	0	0	40	40	40	120
		Species at Risk Model Development	Dfn	8c	RIP	2003-2006	0	0	40	40	40	120
		Recommended Investment Totals					0	0	320	320	320	960
4	A	Wildlife Habitat State of Knowledge	Dpg	9a	RIP	2001-2004	10	10	10	0	0	30
		Wildlife Habitat State of Knowledge	Drv	9a	RIP	2001-2004	10	10	10	0	0	30
		Wildlife Habitat State of Knowledge	Dva	9a	RIP	2001-2004	10	10	10	0	0	30
		Wildlife Habitat State of Knowledge	Dja	9a	RIP	2001-2004	10	10	10	0	0	30
		Wildlife Habitat State of Knowledge	Dmk	9a	RIP	2001-2004	10	10	10	0	0	30
		Wildlife Habitat State of Knowledge	Ddc	9a	RIP	2001-2004	10	10	10	0	0	30
		Wildlife Habitat State of Knowledge	Djo	9a	RIP	2001-2004	10	10	10	0	0	30
		Wildlife Habitat State of Knowledge	Dfn	9a	RIP	2001-2004	10	10	10	0	0	30
		Recommended Investment Totals					80	80	80	0	0	240
	B	Wildlife Habitat Gap Inventory	Dpg	9b	RIP	2001-2006	60	100	100	100	100	460

		Wildlife Habitat Gap Inventory	Drv	9b	RIP	2001-2006	60	100	100	100	100	460
		Wildlife Habitat Gap Inventory	Dva	9b	RIP	2001-2006	60	100	100	100	100	460
		Wildlife Habitat Gap Inventory	Dja	9b	RIP	2001-2006	60	100	100	100	100	460
		Wildlife Habitat Gap Inventory	Dmk	9b	RIP	2001-2006	60	100	100	100	100	460
		Wildlife Habitat Gap Inventory	Ddc	9b	RIP	2001-2006	60	100	100	100	100	460
		Wildlife Habitat Gap Inventory	Djo	9b	RIP	2001-2006	60	100	100	100	100	460
		Wildlife Habitat Gap Inventory	Dfn	9b	RIP	2001-2006	60	100	100	100	100	460
		Recommended Investment Totals					480	800	800	800	800	3680
	C	Wildlife Habitat Decision Model Development	Dpg	9c	RIP	2003-2006	0	0	25	25	25	75
		Wildlife Habitat Decision Model Development	Drv	9c	RIP	2003-2006	0	0	25	25	25	75
		Wildlife Habitat Decision Model Development	Dva	9c	RIP	2003-2006	0	0	25	25	25	75
		Wildlife Habitat Decision Model Development	Dja	9c	RIP	2003-2006	0	0	25	25	25	75
		Wildlife Habitat Decision Model Development	Dmk	9c	RIP	2003-2006	0	0	25	25	25	75
		Wildlife Habitat Decision Model Development	Ddc	9c	RIP	2003-2006	0	0	25	25	25	75
		Wildlife Habitat Decision Model Development	Djo	9c	RIP	2003-2006	0	0	25	25	25	75
		Wildlife Habitat Decision Model Development	Dfn	9c	RIP	2003-2006	0	0	25	25	25	75
		Recommended Investment Totals					0	0	200	200	200	600

5	A	Natural Disturbance Problem Analysis	Dpg	10a	RIP	2001-2006	90	25	25	25	25	190
		Natural Disturbance Problem Analysis	Drv	10a	RIP	2001-2006	90	25	25	25	25	190
		Natural Disturbance Problem Analysis	Dva	10a	RIP	2001-2006	90	25	25	25	25	190
		Natural Disturbance Problem Analysis	Dja	10a	RIP	2001-2006	90	25	25	25	25	190
		Natural Disturbance Problem Analysis	Dmk	10a	RIP	2001-2006	90	25	25	25	25	190
		Natural Disturbance Problem Analysis	Ddc	10a	RIP	2001-2006	90	25	25	25	25	190
		Natural Disturbance Problem Analysis	Djo	10a	RIP	2001-2006	90	25	25	25	25	190
		Natural Disturbance Problem Analysis	Dfn	10a	RIP	2001-2006	90	25	25	25	25	190
		Recommended Investment Totals					720	200	200	200	200	1520
	B	Natural Disturbance Local Data Collection	Dpg	10b	RIP	2001-2006	60	160	160	160	160	700
		Natural Disturbance Local Data Collection	Drv	10b	RIP	2001-2006	60	160	160	160	160	700
		Natural Disturbance Local Data Collection	Dva	10b	RIP	2001-2006	60	160	160	160	160	700
		Natural Disturbance Local Data Collection	Dja	10b	RIP	2001-2006	60	160	160	160	160	700
		Natural Disturbance Local Data Collection	Dmk	10b	RIP	2001-2006	60	160	160	160	160	700
		Natural Disturbance Local Data Collection	Ddc	10b	RIP	2001-2006	60	160	160	160	160	700
		Natural Disturbance Local Data Collection	Djo	10b	RIP	2001-2006	60	160	160	160	160	700

		Natural Disturbance Local Data Collection	Dfn	10b	RIP	2001-2006	60	160	160	160	160	700
		Recommended Investment Totals					480	1280	1280	1280	1280	5600
6	A	SFM Decision Tools Development	Dpg	17	RIP	2001/2004	10	65	65	65	0	205
		SFM Decision Tools Development	Drv	17	RIP	2001/2004	10	65	65	65	0	205
		SFM Decision Tools Development	Dva	17	RIP	2001/2004	10	65	65	65	0	205
		SFM Decision Tools Development	Dja	17	RIP	2001/2004	10	65	65	65	0	205
		SFM Decision Tools Development	Dmk	17	RIP	2001/2004	10	65	65	65	0	205
		SFM Decision Tools Development	Ddc	17	RIP	2001/2004	10	65	65	65	0	205
		SFM Decision Tools Development	Djo	17	RIP	2001/2004	10	65	65	65	0	205
		SFM Decision Tools Development	Dfn	17	RIP	2001/2004	10	65	65	65	0	205
		Recommended Investment Totals					80	520	520	520	0	1640
7	A	Fish/Fish Habitat State of Knowledge	Dpg	28a	RIP	2001-2002	25	0	0	0	0	200
		Fish/Fish Habitat State of Knowledge	Drv	28a	RIP	2001-2002	25	0	0	0	0	200
		Fish/Fish Habitat State of Knowledge	Dva	28a	RIP	2001-2002	25	0	0	0	0	200
		Fish/Fish Habitat State of Knowledge	Dja	28a	RIP	2001-2002	25	0	0	0	0	200
		Fish/Fish Habitat State of Knowledge	Dmk	28a	RIP	2001-2002	25	0	0	0	0	200

		Fish/Fish Habitat State of Knowledge	Ddc	28a	RIP	2001-2002	25	0	0	0	0	200
		Fish/Fish Habitat State of Knowledge	Djo	28a	RIP	2001-2002	25	0	0	0	0	200
		Fish/Fish Habitat State of Knowledge	Dfn	28a	RIP	2001-2002	25	0	0	0	0	200
		Recommended Investment Totals					200	0	0	0	0	1600
	B	Fish/Fish Habitat Gap Inventory	Dpg	28b	RIP	2001-2005	125	250	250	250	0	875
		Fish/Fish Habitat Gap Inventory	Drv	28b	RIP	2001-2005	125	250	250	250	0	875
		Fish/Fish Habitat Gap Inventory	Dva	28b	RIP	2001-2005	125	250	250	250	0	875
		Fish/Fish Habitat Gap Inventory	Dja	28b	RIP	2001-2005	125	250	250	250	0	875
		Fish/Fish Habitat Gap Inventory	Dmk	28b	RIP	2001-2005	125	250	250	250	0	875
		Fish/Fish Habitat Gap Inventory	Ddc	28b	RIP	2001-2005	125	250	250	250	0	875
		Fish/Fish Habitat Gap Inventory	Djo	28b	RIP	2001-2005	125	250	250	250	0	875
		Fish/Fish Habitat Gap Inventory	Dfn	28b	RIP	2001-2005	125	250	250	250	0	875
		Recommended Investment Totals					1000	2000	2000	2000	0	7000
	C	Fish/Fish Habitat Model Development	Dpg	28c	RIP	2001-2006	10	35	35	35	35	150
		Fish/Fish Habitat Model Development	Drv	28c	RIP	2001-2006	10	35	35	35	35	150
		Fish/Fish Habitat Model Development	Dva	28c	RIP	2001-2006	10	35	35	35	35	150

		Fish/Fish Habitat Model Development	Dja	28c	RIP	2001-2006	10	35	35	35	35	150
		Fish/Fish Habitat Model Development	Dmk	28c	RIP	2001-2006	10	35	35	35	35	150
		Fish/Fish Habitat Model Development	Ddc	28c	RIP	2001-2006	10	35	35	35	35	150
		Fish/Fish Habitat Model Development	Djo	28c	RIP	2001-2006	10	35	35	35	35	150
		Fish/Fish Habitat Model Development	Dfn	28c	RIP	2001-2006	10	35	35	35	35	150
		Recommended Investment Totals					80	280	280	280	280	1200
8	A	Mixedwood State of Knowledge	Ddc	19a	RIP	2001-2003	65	35	0	0	0	100
		Mixedwood State of Knowledge	Djo	19a	RIP	2001-2003	65	35	0	0	0	100
		Mixedwood State of Knowledge	Dfn	19a	RIP	2001-2003	65	35	0	0	0	100
		Recommended Investment Totals					195	105	0	0	0	300
	B	Mixedwood Problem Analysis/Local Research	Ddc	19b	RIP	2001-2006	165	165	165	165	165	825
		Mixedwood Problem Analysis/Local Research	Djo	19b	RIP	2001-2006	165	165	165	165	165	825
		Mixedwood Problem Analysis/Local Research	Dfn	19b	RIP	2001-2006	165	165	165	165	165	825
		Recommended Investment Totals					495	495	495	495	495	2475
	C	Mixedwood Model Development	Ddc	19c	RIP	2001-2003 2005-2006	35	35	0	0	70	140
		Mixedwood Model Development	Djo	19c	RIP	2001-2003 2005-2006	35	35	0	0	70	140

		Mixedwood Model Development	Dfn	19c	RIP	2001-2003 2005-2006	35	35	0	0	70	140
		Recommended Investment Totals					105	105	0	0	210	420
9	A	Pest Management Decision Tool Development	Dva	24	RIP	2001/2003	100	100	0	0	0	200
		Recommended Investment Totals					100	100	0	0	0	200
10	A	TRIM II	Dpg	27	RIP	2001/2003	125	155	0	0	0	280
		TRIM II	Drv	27	RIP	2001/2003	125	155	0	0	0	280
		TRIM II	Dva	27	RIP	2001/2003	125	155	0	0	0	280
		TRIM II	Dja	27	RIP	2001/2003	125	155	0	0	0	280
		TRIM II	Dmk	27	RIP	2001/2003	125	155	0	0	0	280
		TRIM II	Ddc	27	RIP	2001/2003	125	155	0	0	0	280
		TRIM II	Djo	27	RIP	2001/2003	125	155	0	0	0	280
		TRIM II	Dfn	27	RIP	2001/2003	125	155	0	0	0	280
		Recommended Investment Totals					1000	1240	0	0	0	2240
11	A	Alternative Harvesting State of Knowledge	Drv	32a	RIP	2001-2002	50	0	0	0	0	50
		Alternative Harvesting State of Knowledge	Dja	32a	RIP	2001-2002	50	0	0	0	0	50
		Recommended Investment Totals					100	0	0	0	0	100

	B	Alternative Harvesting Local Trials	Dpg	32b	RIP	2002-2006	0	85	85	40	40	250
		Alternative Harvesting Local Trials	Drv	32b	RIP	2002-2006	0	85	85	40	40	250
		Alternative Harvesting Local Trials	Dva	32b	RIP	2002-2006	0	85	85	40	40	250
		Alternative Harvesting Local Trials	Dja	32b	RIP	2002-2006	0	85	85	40	40	250
		Alternative Harvesting Local Trials	Dmk	32b	RIP	2002-2006	0	85	85	40	40	250
		Alternative Harvesting Local Trials	Ddc	32b	RIP	2002-2006	0	85	85	40	40	250
		Recommended Investment Totals					0	510	510	240	240	1500
	C	Alternative Harvesting Monitoring	Dpg	32c	RIP	2005-2006	0	0	0	0	30	30
		Alternative Harvesting Monitoring	Drv	32c	RIP	2005-2006	0	0	0	0	30	30
		Alternative Harvesting Monitoring	Dva	32c	RIP	2005-2006	0	0	0	0	30	30
		Alternative Harvesting Monitoring	Dja	32c	RIP	2005-2006	0	0	0	0	30	30
		Alternative Harvesting Monitoring	Dmk	32c	RIP	2005-2006	0	0	0	0	30	30
		Alternative Harvesting Monitoring	Ddc	32c	RIP	2005-2006	0	0	0	0	30	30
		Alternative Harvesting Monitoring	Djo	32c	RIP	2005-2006	0	0	0	0	30	30
		Alternative Harvesting Monitoring	Dfn	32c	RIP	2005-2006	0	0	0	0	30	30
		Recommended Investment Totals					0	0	0	0	240	240

12	A	Archeological Values Problem Analysis	Dpg	36a	RIP	2001-2002	12	0	0	0	0	12
		Archeological Values Problem Analysis	Drv	36a	RIP	2001-2002	12	0	0	0	0	12
		Archeological Values Problem Analysis	Dva	36a	RIP	2001-2002	12	0	0	0	0	12
		Archeological Values Problem Analysis	Dja	36a	RIP	2001-2002	12	0	0	0	0	12
		Archeological Values Problem Analysis	Dmk	36a	RIP	2001-2002	12	0	0	0	0	12
		Archeological Values Problem Analysis	Ddc	36a	RIP	2001-2002	12	0	0	0	0	12
		Archeological Values Problem Analysis	Djo	36a	RIP	2001-2002	12	0	0	0	0	12
		Archeological Values Problem Analysis	Dfn	36a	RIP	2001-2002	12	0	0	0	0	12
		Recommended Investment Totals					96	0	0	0	0	96
	B	Archeological Values Field Inventory	Dpg	36b	RIP	2001-2004	125	125	125	0	0	375
		Archeological Values Field Inventory	Drv	36b	RIP	2001-2004	125	125	125	0	0	375
		Archeological Values Field Inventory	Dva	36b	RIP	2001-2004	125	125	125	0	0	375
		Archeological Values Field Inventory	Dja	36b	RIP	2001-2004	125	125	125	0	0	375
		Archeological Values Field Inventory	Dmk	36b	RIP	2001-2004	125	125	125	0	0	375
		Archeological Values Field Inventory	Ddc	36b	RIP	2001-2004	125	125	125	0	0	375
		Archeological Values Field Inventory	Djo	36b	RIP	2001-2004	125	125	125	0	0	375
		Archeological Values Field Inventory	Dfn	36b	RIP	2001-2004	125	125	125	0	0	375

		Recommended Investment Totals					1000	1000	1000	0	0	3000
	C	Archeological Values Decision Tools	Dpg	36c	RIP	2004-2005	0	0	0	25	0	25
		Archeological Values Decision Tools	Drv	36c	RIP	2004-2005	0	0	0	25	0	25
		Archeological Values Decision Tools	Dva	36c	RIP	2004-2005	0	0	0	25	0	25
		Archeological Values Decision Tools	Dja	36c	RIP	2004-2005	0	0	0	25	0	25
		Archeological Values Decision Tools	Dmk	36c	RIP	2004-2005	0	0	0	25	0	25
		Archeological Values Decision Tools	Ddc	36c	RIP	2004-2005	0	0	0	25	0	25
		Archeological Values Decision Tools	Djo	36c	RIP	2004-2005	0	0	0	25	0	25
		Archeological Values Decision Tools	Dfn	36c	RIP	2004-2005	0	0	0	25	0	25
		Recommended Investment Totals					0	0	0	200	0	200
13	A	Visual Sensitivity Field Inventory	Dpg	37a	RIP	2001-2003	100	100	0	0	0	200
		Visual Sensitivity Field Inventory	Drv	37a	RIP	2001-2003	100	100	0	0	0	200
		Visual Sensitivity Field Inventory	Dva	37a	RIP	2001-2003	100	100	0	0	0	200
		Visual Sensitivity Field Inventory	Dja	37a	RIP	2001-2003	100	100	0	0	0	200
		Visual Sensitivity Field Inventory	Dmk	37a	RIP	2001-2003	100	100	0	0	0	200
		Visual Sensitivity Field Inventory	Ddc	37a	RIP	2001-2003	100	100	0	0	0	200

		Visual Sensitivity Field Inventory	Djo	37a	RIP	2001-2003	100	100	0	0	0	200
		Visual Sensitivity Field Inventory	Dfn	37a	RIP	2001-2003	100	100	0	0	0	200
		Recommended Investment Totals					800	800	0	0	0	1600
	B	Visual Sensitivity State of Knowledge	Dpg	37b	RIP	2001-2002	50	0	0	0	0	50
		Visual Sensitivity State of Knowledge	Drv	37b	RIP	2001-2002	50	0	0	0	0	50
		Visual Sensitivity State of Knowledge	Dva	37b	RIP	2001-2002	50	0	0	0	0	50
		Visual Sensitivity State of Knowledge	Dja	37b	RIP	2001-2002	50	0	0	0	0	50
		Visual Sensitivity State of Knowledge	Dmk	37b	RIP	2001-2002	50	0	0	0	0	50
		Visual Sensitivity State of Knowledge	Ddc	37b	RIP	2001-2002	50	0	0	0	0	50
		Visual Sensitivity State of Knowledge	Djo	37b	RIP	2001-2002	50	0	0	0	0	50
		Visual Sensitivity State of Knowledge	Dfn	37b	RIP	2001-2002	50	0	0	0	0	50
		Recommended Investment Totals					400	0	0	0	0	400
14	A	Site Productivity State of Knowledge	Dpg	54a	RIP	2001-2002	65	0	0	0	0	65
		Site Productivity State of Knowledge	Drv	54a	RIP	2001-2002	65	0	0	0	0	65
		Site Productivity State of Knowledge	Dva	54a	RIP	2001-2002	65	0	0	0	0	65
		Site Productivity State of Knowledge	Dja	54a	RIP	2001-2002	65	0	0	0	0	65
		Site Productivity State of Knowledge	Dmk	54a	RIP	2001-2002	65	0	0	0	0	65

		Site Productivity State of Knowledge	Ddc	54a	RIP	2001-2002	65	0	0	0	0	65
		Site Productivity State of Knowledge	Djo	54a	RIP	2001-2002	65	0	0	0	0	65
		Site Productivity State of Knowledge	Dfn	54a	RIP	2001-2002	65	0	0	0	0	65
		Recommended Investment Totals					520	0	0	0	0	520
	B	Site Productivity Gap Research	Dpg	54b	RIP	2001-2004	125	125	60	0	0	310
		Site Productivity Gap Research	Drv	54b	RIP	2001-2004	125	125	60	0	0	310
		Site Productivity Gap Research	Dva	54b	RIP	2001-2004	125	125	60	0	0	310
		Site Productivity Gap Research	Dja	54b	RIP	2001-2004	125	125	60	0	0	310
		Site Productivity Gap Research	Dmk	54b	RIP	2001-2004	125	125	60	0	0	310
		Site Productivity Gap Research	Ddc	54b	RIP	2001-2004	125	125	60	0	0	310
		Site Productivity Gap Research	Djo	54b	RIP	2001-2004	125	125	60	0	0	310
		Site Productivity Gap Research	Dfn	54b	RIP	2001-2004	125	125	60	0	0	310
		Recommended Investment Totals					1000	1000	480	0	0	2480

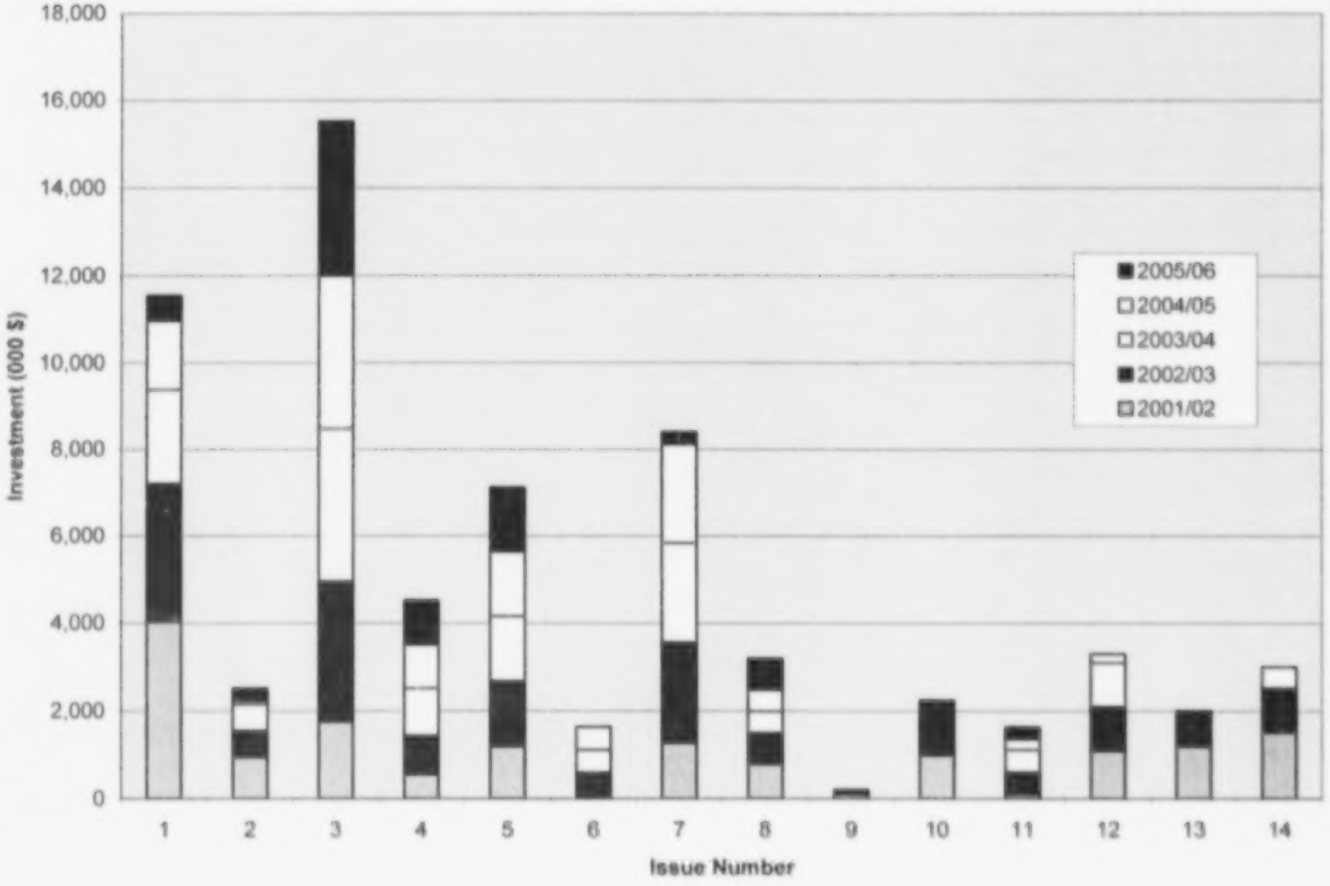

Figure 8.3 Recommended knowledge investment portfolio, by Key SSFM Issue, over a 5 years.

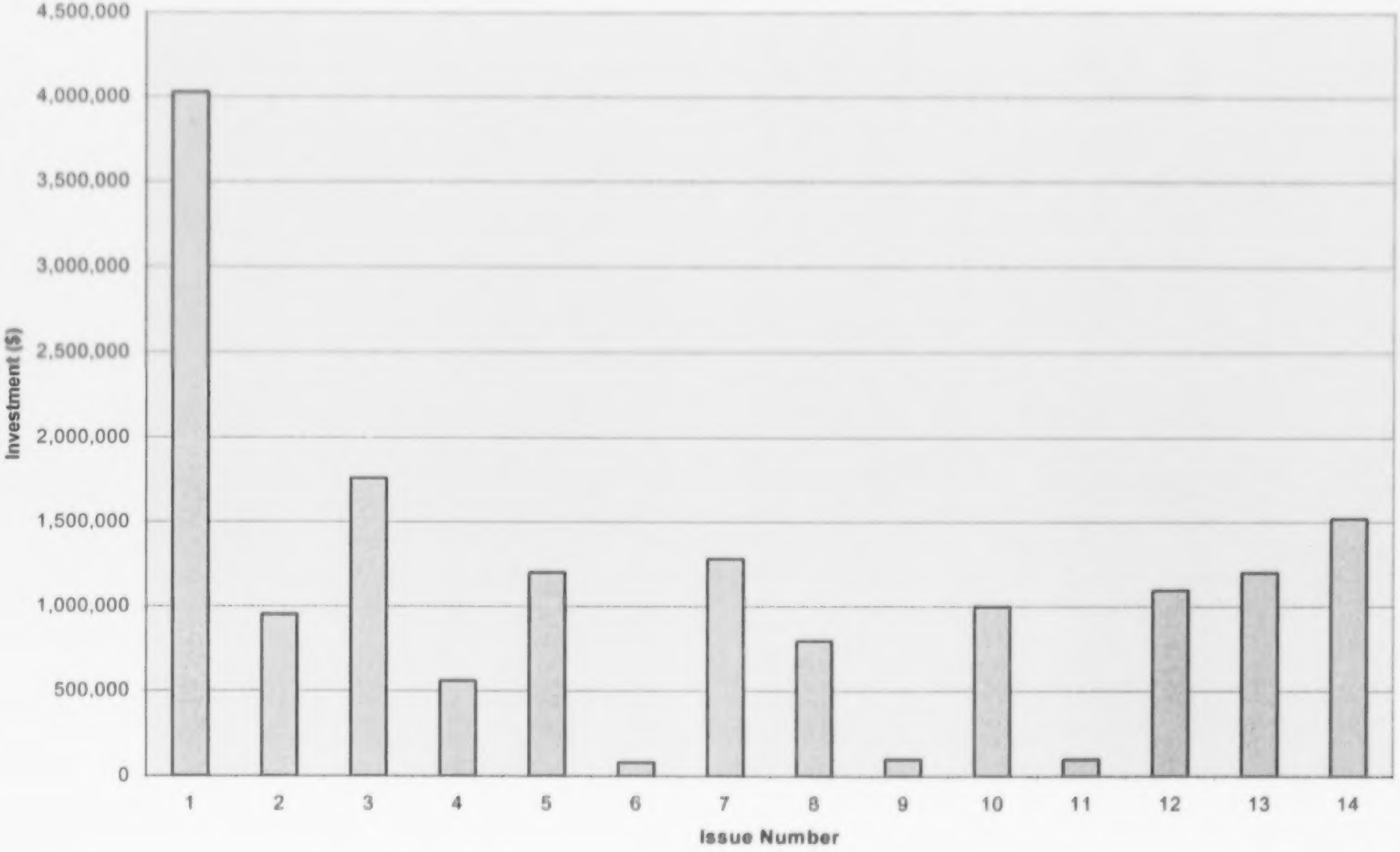

Figure 8.4 Recommended Knowledge Investment portfolio, by Key SSFM Issue, for fiscal year 2001/2002.

Table 8.9 Recommended Investments for Key Regional Issues by Management Unit

Management Unit	Knowledge Investment Project	Regional Rank	2001/02 ($000)	2002/03 ($000)	2003/04 ($000)	2004/05 ($000)	2005/06 ($000)	Total ($000)
Dawson Creek	Caribou Decision Model Development	2	0	0	0	10	35	45
	VRI Field Inventory	4	350	250	0	0	0	500
	VRI State of Inventory	4	75	10	10	10	10	115
	Species at Risk Gap Inventory	8	200	400	400	400	400	1800
	Species at Risk Model Development	8	0	0	40	40	40	120
	Species at Risk State of Knowledge	8	20	0	0	0	0	20
	Wildlife Habitat Decision Model Development	9	0	0	25	25	25	75
	Wildlife Habitat Gap Inventory	9	60	100	100	100	100	460
	Wildlife Habitat State of Knowledge	9	10	10	10	0	0	30
	Natural Disturbance Local Data Collection	10	60	160	160	160	160	700
	Natural Disturbance Problem Analysis	10	90	25	25	25	25	190
	SFM Decision Tools Development	17	10	65	65	65	0	205
	Mixedwood Model Development	19	35	35	0	0	70	140
	Mixedwood Problem Analysis/Local Research	19	165	165	165	165	165	825
	Mixedwood State of Knowledge	19	65	35	0	0	0	100
	Caribou Gap Inventory	20	100	100	100	0	0	300
	Caribou State of Knowledge	20	50	0	0	0	0	50
	TRIM II	27	125	155	0	0	0	280
	Fish/Fish Habitat Gap Inventory	28	125	250	250	250	0	875
	Fish/Fish Habitat Model Development	28	10	35	35	35	35	150
	Fish/Fish Habitat State of Knowledge	28	25	0	0	0	0	200
	Alternative Harvesting Local Trials	32	0	85	85	40	40	250
	Alternative Harvesting Monitoring	32	0	0	0	0	30	30

	Archeological Values Decision Tools Development	36	0	0	0	25	0	25
	Archeological Values Field Inventory	36	125	125	125	0	0	375
	Archeological Values Problem Analysis	36	12	0	0	0	0	12
	Visual Sensitivity Field Inventory	37	100	100	0	0	0	200
	Visual Sensitivity State of Knowledge	37	50	0	0	0	0	50
	Site Productivity Gap Research	54	125	125	60	0	0	310
	Site Productivity State of Knowledge	54	65	0	0	0	0	65
	Recommended District Investment Plan		**2052**	**2230**	**1655**	**1350**	**1135**	**8497**
Fort Nelson	VRI Field Inventory	1	1250	1000	500	500	0	3000
	VRI State of Inventory	1	75	10	10	10	10	115
	Caribou Decision Model Development	2	0	0	0	10	35	45
	Caribou Gap Inventory	5	100	100	100	0	0	300
	Caribou State of Knowledge	5	50	0	0	0	0	50
	Species at Risk Gap Inventory	8	200	400	400	400	400	1800
	Species at Risk Model Development	8	0	0	40	40	40	120
	Species at Risk State of Knowledge	8	20	0	0	0	0	20
	Wildlife Habitat Decision Model Development	9	0	0	25	25	25	75
	Wildlife Habitat Gap Inventory	9	60	100	100	100	100	460
	Wildlife Habitat State of Knowledge	9	10	10	10	0	0	30
	Natural Disturbance Local Data Collection	10	60	160	160	160	160	700
	Natural Disturbance Problem Analysis	10	90	25	25	25	25	190
	SFM Decision Tools Development	17	10	65	65	65	0	205
	Mixedwood Model Development	19	35	35	0	0	70	140
	Mixedwood Problem Analysis/Local Research	19	165	165	165	165	165	825
	Mixedwood State of Knowledge	19	65	35	0	0	0	100
	TRIM II	27	125	155	0	0	0	280

	Fish/Fish Habitat Gap Inventory	28	125	250	250	250	0	875
	Fish/Fish Habitat Model Development	28	10	35	35	35	35	150
	Fish/Fish Habitat State of Knowledge	28	25	0	0	0	0	200
	Alternative Harvesting Monitoring	32	0	0	0	0	30	30
	Archaeological Values Decision Tools Development	36	0	0	0	25	0	25
	Archaeological Values Field Inventory	36	125	125	125	0	0	375
	Archaeological Values Problem Analysis	36	12	0	0	0	0	12
	Visual Sensitivity Field Inventory	37	100	100	0	0	0	200
	Visual Sensitivity State of Knowledge	37	50	0	0	0	0	50
	Site Productivity Gap Research	54	125	125	60	0	0	310
	Site Productivity State of Knowledge	54	65	0	0	0	0	65
	Recommended District Investment Plan		**2952**	**2895**	**2070**	**1810**	**1095**	**10747**
Fort St. James	VRI State of Inventory	1	75	10	10	10	10	115
	Caribou Decision Model Development	2	0	0	0	10	35	45
	Caribou Gap Inventory	6	100	100	100	0	0	300
	Caribou State of Knowledge	6	100	0	0	0	0	100
	Species at Risk Gap Inventory	8	200	400	400	400	400	1800
	Species at Risk Model Development	8	0	0	40	40	40	120
	Species at Risk State of Knowledge	8	20	0	0	0	0	20
	Wildlife Habitat Decision Model Development	9	0	0	25	25	25	75
	Wildlife Habitat Gap Inventory	9	60	100	100	100	100	460
	Wildlife Habitat State of Knowledge	9	10	10	10	0	0	30
	Natural Disturbance Local Data Collection	10	60	160	160	160	160	700
	Natural Disturbance Problem Analysis	10	90	25	25	25	25	190
	SFM Decision Tools Development	17	10	65	65	65	0	205
	TRIM II	27	125	155	0	0	0	280

	Fish/Fish Habitat Gap Inventory	28	125	250	250	250	0	875
	Fish/Fish Habitat Model Development	28	10	35	35	35	35	150
	Fish/Fish Habitat State of Knowledge	28	25	0	0	0	0	200
	Alternative Harvesting Local Trials	32	0	85	85	40	40	250
	Alternative Harvesting Monitoring	32	0	0	0	0	30	30
	Alternative Harvesting State of Knowledge	32	50	0	0	0	0	50
	Archaeological Values Decision Tools Development	36	0	0	0	25	0	25
	Archaeological Values Field Inventory	36	125	125	125	0	0	375
	Archaeological Values Problem Analysis	36	12	0	0	0	0	12
	Visual Sensitivity Field Inventory	37	100	100	0	0	0	200
	Visual Sensitivity State of Knowledge	37	50	0	0	0	0	50
	Site Productivity Gap Research	54	125	125	60	0	0	310
	Site Productivity State of Knowledge	54	65	0	0	0	0	65
	Recommended District Investment Plan		**1537**	**1745**	**1490**	**1185**	**900**	**7032**
Fort St. John	Caribou Decision Model Development	2	0	0	0	10	35	45
	VRI Field Inventory	3	1000	750	750	500	500	3150
	VRI State of Inventory	3	75	10	10	10	10	115
	Species at Risk Gap Inventory	8	200	400	400	400	400	1800
	Species at Risk Model Development	8	0	0	40	40	40	120
	Species at Risk State of Knowledge	8	20	0	0	0	0	20
	Wildlife Habitat Decision Model Development	9	0	0	25	25	25	75
	Wildlife Habitat Gap Inventory	9	60	100	100	100	100	460
	Wildlife Habitat State of Knowledge	9	10	10	10	0	0	30
	Natural Disturbance Local Data Collection	10	60	160	160	160	160	700
	Natural Disturbance Problem Analysis	10	90	25	25	25	25	190
	SFM Decision Tools Development	17	10	65	65	65	0	205

	Mixedwood Model Development	19	35	35	0	0	70	140
	Mixedwood Problem Analysis/Local Research	19	165	165	165	165	165	825
	Mixedwood State of Knowledge	19	65	35	0	0	0	100
	TRIM II	27	125	155	0	0	0	280
	Fish/Fish Habitat Gap Inventory	28	125	250	250	250	0	875
	Fish/Fish Habitat Model Development	28	10	35	35	35	35	150
	Fish/Fish Habitat State of Knowledge	28	25	0	0	0	0	200
	Alternative Harvesting Monitoring	32	0	0	0	0	30	30
	Archaeological Values Decision Tools Development	36	0	0	0	25	0	25
	Archaeological Values Field Inventory	36	125	125	125	0	0	375
	Archaeological Values Problem Analysis	36	12	0	0	0	0	12
	Visual Sensitivity Field Inventory	37	100	100	0	0	0	200
	Visual Sensitivity State of Knowledge	37	50	0	0	0	0	50
	Site Productivity Gap Research	54	125	125	60	0	0	310
	Site Productivity State of Knowledge	54	65	0	0	0	0	65
	Recommended District Investment Plan		**2552**	**2545**	**2220**	**1810**	**1595**	**10547**
Mackenzie	Caribou Decision Model Development	2	0	0	0	10	35	45
	Species at Risk Gap Inventory	8	200	400	400	400	400	1800
	Species at Risk Model Development	8	0	0	40	40	40	120
	Species at Risk State of Knowledge	8	20	0	0	0	0	20
	Wildlife Habitat Decision Model Development	9	0	0	25	25	25	75
	Wildlife Habitat Gap Inventory	9	60	100	100	100	100	460
	Wildlife Habitat State of Knowledge	9	10	10	10	0	0	30
	Natural Disturbance Local Data Collection	10	60	160	160	160	160	700
	Natural Disturbance Problem Analysis	10	90	25	25	25	25	190
	Caribou Gap Inventory	12	100	100	100	0	0	300

	Caribou State of Knowledge	12	50	0	0	0	0	50
	VRI Field Inventory	15	75	500	500	500	0	1550
	VRI State of Inventory	15	75	10	10	10	10	115
	SFM Decision Tools Development	17	10	65	65	65	0	205
	TRIM II	27	125	155	0	0	0	280
	Fish/Fish Habitat Gap Inventory	28	125	250	250	250	0	875
	Fish/Fish Habitat Model Development	28	10	35	35	35	35	150
	Fish/Fish Habitat State of Knowledge	28	25	0	0	0	0	200
	Alternative Harvesting Local Trials	32	0	85	85	40	40	250
	Alternative Harvesting Monitoring	32	0	0	0	0	30	30
	Archaeological Values Decision Tools Development	36	0	0	0	25	0	25
	Archaeological Values Field Inventory	36	125	125	125	0	0	375
	Archaeological Values Problem Analysis	36	12	0	0	0	0	12
	Visual Sensitivity Field Inventory	37	100	100	0	0	0	200
	Visual Sensitivity State of Knowledge	37	50	0	0	0	0	50
	Site Productivity Gap Research	54	125	125	60	0	0	310
	Site Productivity State of Knowledge	54	65	0	0	0	0	65
	Recommended District Investment Plan		**1512**	**2245**	**1990**	**1685**	**900**	**8482**
Prince George	Caribou Decision Model Development	2	0	0	0	10	35	45
	Caribou Gap Inventory	2	100	100	100			300
	VRI Field Inventory	7	150	100	100	0	0	300
	VRI State of Inventory	7	75	10	10	10	10	115
	Species at Risk Gap Inventory	8	200	400	400	400	400	1800
	Species at Risk Model Development	8	0	0	40	40	40	120
	Species at Risk State of Knowledge	8	20	0	0	0	0	20
	Caribou State of Knowledge	9	50	0	0	0	0	50

	Wildlife Habitat Decision Model Development	9	0	0	25	25	25	75
	Wildlife Habitat Gap Inventory	9	60	100	100	100	100	460
	Wildlife Habitat State of Knowledge	9	10	10	10	0	0	30
	Natural Disturbance Local Data Collection	10	60	160	160	160	160	700
	Natural Disturbance Problem Analysis	10	90	25	25	25	25	190
	SFM Decision Tools Development	17	10	65	65	65	0	205
	TRIM II	27	125	155	0	0	0	280
	Fish/Fish Habitat Gap Inventory	28	125	250	250	250	0	875
	Fish/Fish Habitat Model Development	28	10	35	35	35	35	150
	Fish/Fish Habitat State of Knowledge	28	25	0	0	0	0	200
	Alternative Harvesting Local Trials	32	0	85	85	40	40	250
	Alternative Harvesting Monitoring	32	0	0	0	0	30	30
	Archaeological Values Decision Tools Development	36	0	0	0	25	0	25
	Archaeological Values Field Inventory	36	125	125	125	0	0	375
	Archaeological Values Problem Analysis	36	12	0	0	0	0	12
	Visual Sensitivity Field Inventory	37	100	100	0	0	0	200
	Visual Sensitivity State of Knowledge	37	50	0	0	0	0	50
	Site Productivity Gap Research	54	125	125	60	0	0	310
	Site Productivity State of Knowledge	54	65	0	0	0	0	65
	Recommended District Investment Plan		**1587**	**1845**	**1590**	**1175**	**865**	**7232**
Robson Valley	Caribou Decision Model Development	2	0	0	0	10	35	45
	Species at Risk Gap Inventory	8	200	400	400	400	400	1800
	Species at Risk Model Development	8	0	0	40	40	40	120
	Species at Risk State of Knowledge	8	20	0	0	0	0	20
	Wildlife Habitat Decision Model Development	9	0	0	25	25	25	75
	Wildlife Habitat Gap Inventory	9	60	100	100	100	100	460

	Wildlife Habitat State of Knowledge	9	10	10	10	0	0	30
	Natural Disturbance Local Data Collection	10	60	160	160	160	160	700
	Natural Disturbance Problem Analysis	10	90	25	25	25	25	190
	SFM Decision Tools Development	17	10	65	65	65	0	205
	TRIM II	27	125	155	0	0	0	280
	Fish/Fish Habitat Gap Inventory	28	125	250	250	250	0	875
	Fish/Fish Habitat Model Development	28	10	35	35	35	35	150
	Fish/Fish Habitat State of Knowledge	28	25	0	0	0	0	200
	Alternative Harvesting Local Trials	32	0	85	85	40	40	250
	Alternative Harvesting Monitoring	32	0	0	0	0	30	30
	Alternative Harvesting State of Knowledge	32	50	0	0	0	0	50
	Archaeological Values Decision Tools Development	36	0	0	0	25	0	25
	Archaeological Values Field Inventory	36	125	125	125	0	0	375
	Archaeological Values Problem Analysis	36	12	0	0	0	0	12
	Visual Sensitivity Field Inventory	37	100	100	0	0	0	200
	Visual Sensitivity State of Knowledge	37	50	0	0	0	0	50
	VRI Field Inventory	40	0	250	250	0	0	500
	VRI State of Inventory	40	75	10	10	10	10	115
	Site Productivity Gap Research	54	125	125	60	0	0	310
	Site Productivity State of Knowledge	54	65	0	0	0	0	65
	Recommended District Investment Plan		**1337**	**1895**	**1640**	**1185**	**900**	**7132**
Vanderhoof	Caribou Decision Model Development	2	0	0	0	10	35	45
	Caribou Gap Inventory	2	100	100	100	0	0	300
	Caribou State of Knowledge	2	50	0	0	0	0	50
	Species at Risk Gap Inventory	8	200	400	400	400	400	1800
	Species at Risk Model Development	8	0	0	40	40	40	120

Species at Risk State of Knowledge	8	20	0	0	0	0	20
Wildlife Habitat Decision Model Development	9	0	0	25	25	25	75
Wildlife Habitat Gap Inventory	9	60	100	100	100	100	460
Wildlife Habitat State of Knowledge	9	10	10	10	0	0	30
Natural Disturbance Local Data Collection	10	60	160	160	160	160	700
Natural Disturbance Problem Analysis	10	90	25	25	25	25	190
VRI Field Inventory	11	600	250	0	0	0	750
VRI State of Inventory	11	75	10	10	10	10	115
SFM Decision Tools Development	17	10	65	65	65	0	205
Pest Management Decision Tool Development	24	100	100	0	0	0	200
TRIM II	27	125	155	0	0	0	280
Fish/Fish Habitat Gap Inventory	28	125	250	250	250	0	875
Fish/Fish Habitat Model Development	28	10	35	35	35	35	150
Fish/Fish Habitat State of Knowledge	28	25	0	0	0	0	200
Alternative Harvesting Local Trials	32	0	85	85	40	40	250
Alternative Harvesting Monitoring	32	0	0	0	0	30	30
Archaeological Values Decision Tools Development	36	0	0	0	25	0	25
Archaeological Values Field Inventory	36	125	125	125	0	0	375
Archaeological Values Problem Analysis	36	12	0	0	0	0	12
Visual Sensitivity Field Inventory	37	100	100	0	0	0	200
Visual Sensitivity State of Knowledge	37	50	0	0	0	0	50
Site Productivity Gap Research	54	125	125	60	0	0	310
Site Productivity State of Knowledge	54	65	0	0	0	0	65
Recommended District Investment Plan		**2137**	**2095**	**1490**	**1185**	**900**	**7882**

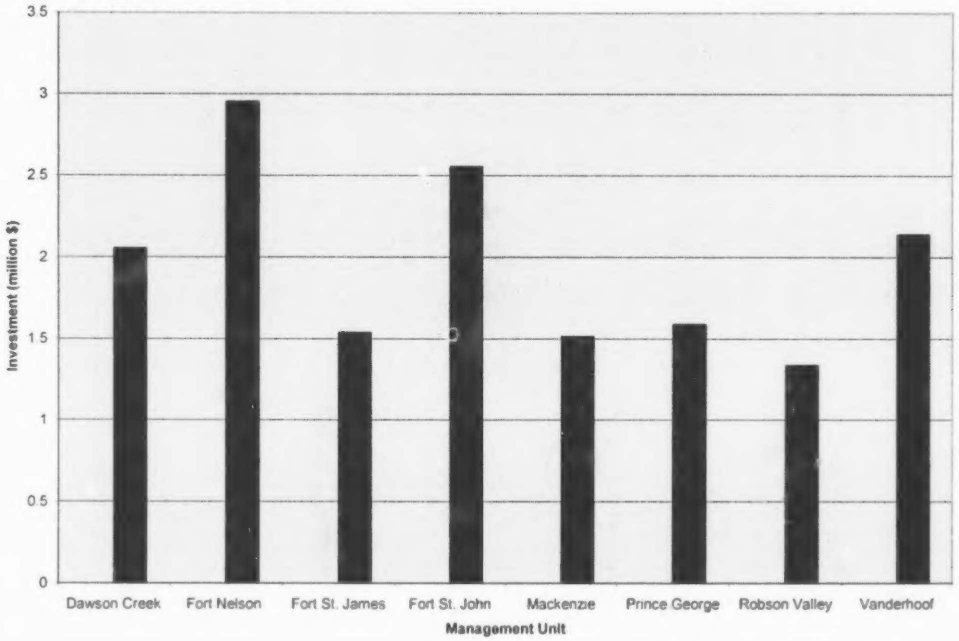

Figure 8.5 Recommended management unit knowledge investment plan for fiscal year 2001/2002z

8.5 TACTICAL PLANNING

The foregoing analysis has identified broad issues of concern to the SSFM program. To these issues broad knowledge based investment strategies have been developed. The next phase of program development necessarily involves refinement of the strategies and selection of detailed investment tactics. This phase is crucial to the preparation of operational Forest Renewal Work Plans, and will provide greater detail regarding the impact of investments on SFM practices, anticipated benefits and performance indicators.

8.5.1 TACTICAL WORKING GROUPS

The Regional Technical Planning Committee recommend that SSFM tactical planning be facilitated through technical working groups comprising agency and licensee technical specialists and other key stakeholders from each Forest District. This approach to tactical planning is supported in principle by Omineca-Peace Investment Officers, and is expected to result in comprehensive, project work plans for participating Multi-year Agreement holders.

Table 8.10 identifies key issue-related tactical working group core members. The Technical Committee strongly encourage stakeholders to contact these members immediately following resource investment plan meetings, in order to expedite tactical planning. Interested participation in these groups will ensure adequate networking between management units where issues and tactics are common to both.

Table 8.10 SSFM Tactical Planning Working Group Core Members

SSFM Tactical Working Groups	Core Team Members
Vegetation Resouce Inventories	Dick Nakatsu, MoF Kerry Deschamps, Canadian Forestry Products Ltd.
Caribou Management	Beryl Nesbit, MoELP Dale Seip, MoF Doug Heard, MoELP Kerry Deschamps, Canadian Forestry Products Ltd
Species-at-Risk Management	Beryl Nesbit, MoELP Kerry Deschamps, Canadian Forestry Products Ltd. Doug Wilson, MoELP
Wildlife Habitat Management	Beryl Nesbit, MoELP Chris Ritchie, MoELP
Natural Disturbance/Biodiversity	Craig DeLong, MoF Kerry Deschamps, Canadian Forestry Products Ltd. Chris Ritchie, MoELP
Forest Management Decision Support	Kerry Deschamps, Canadian Forestry Products Ltd.
Fish and Fish Habitat Management	Lynn Blouw, MoELP Beryl Nesbit, MoELP
Boreal Mixedwood Management	Richard Kabzem, MoF Larry Badowski, MoF Dick Nakatsu, MoF
Pest Management Decision Support	Bob Hodgkinson, MoF Richard Reich, MoF
Spatial Resource Base Maps	Dick Nakatsu, MoF
Alternative Harvesting	Mike Jull, UNBC Chris Ritchie, MoELP
Archeological Values	Diane Reed, MoF
Visual Resource Management	Luc Roberge, MoF Diane Reed, MoF
Managed Stand Site Productivity	Kerry Deschamps, Canadian Forestry Products Ltd. Larry Badowski, MoF

8.5.2 TRANSITION PROJECTS

This element of the RMP will be developed, in conjunction with the Regional Technical Planning Committee and Omineca-Peace Investment Officers during November and December. Advice will be sought from Tactical Working Groups regarding the strategic value of past and on-going MYA investment projects, to ensure investment efficiency. The final decision regarding transition investments will lie with Forest Renewal BC.

8.6 RESEARCH PRIORITIES

Several of the knowledge strategies represent research investments, or contain elements of research within them. Table 8.111identifies these strategies.

The Regional Technical Planning Committee strongly recommends that management of these research elements of the SSFM remain within the jurisdiction of local stakeholders. The strategy of research planning via inter-management unit committees is a viable, and preferred approach to Omineca-Peace research and development. The approach promotes strong client group participation, thereby ensuring the utility of the research results, as well as continuous extension benefits. These research and development investments should not be incorporated into the Forest Renewal Research Program, but remain as an integral component of the local SSFM program.

Table 8.11 Research Elements of the SSFM RMP.

Issue #	Issue	Strategy ID	Knowledge Strategy
2	Incomplete Caribou Management Objectives	A	Caribou Management Decision Model Development
3	Lack of Species-at-risk Management Objectives	C	Species-at-risk Projection Model Development
4	Lack of General Wildlife Habitat Management Objectives	C	Wildlife Habitat Decision Model
5	Unknown Natural Disturbance, Biodiversity and Natural Successional Dynamics Benchmarks	A	Natural Disturbance Problem Analysis
7	Incomplete Fish and Fish Habitat Objectives	C	Fish/Fish Habitat Habitat Modelling
8	Incomplete Understanding of Mixedwood Stand Dynamics and Management Objectives	B	Mixedwood Problem Analysis/Local Research
		C	Mixedwood Model Development and Extension
9	Lack of Pest Management Decision Tools	9	Pest Management Decision Tool Development
11	Lack of Alternative Harvesting Experience	B	Alternative Harvesting Local Trials
12	Lack of Archaeological Value Preservation Objectives	C	Archaeological Values Decision Tools Development
14	Inadequate Understanding of Managed Stand Site Productivity Potential	B	Site Productivity Gap Research

8.6.1 PROVINCIAL AND HEADQUARTERS INVESTMENT PRIORITIES

The Regional Technical Planning Committee recommends against transfer of any of the strategic knowledge investments to the Provincial level. Those strategic solutions requiring provincial "consistency" have been identified in foregoing sections of this report. We do, however, recommend that a provincial co-ordinating committee be assembled, where appropriate, to liaise with local SSFM committees to ensure the portability of any investment output.

9 FOREST RESOURCES INVENTORY

9.1 INVENTORY STATUS BY BUSINESS DRIVER

Please turn to the next page

9.1.1 PRINCE GEORGE FOREST DISTRICT

Table 9.1.1 - 2: Inventory Status and Need by Business Driver

			Business Driver																									
Region: Prince George	District: Prince George		International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	Type (Intensity)	Status	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management Strategy	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features, Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	C											M	M	M		L						H					
	range cultural inventory	C									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity	B								L	L		L	L	L	L	L			L	M							
	recreation features	C								L	L		L	L	L	L	L			L	H		H	H			M	M
Terrain (Stability) Mapping	Level E/D/C reconnaisance	C								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	C								L				L	L	L		H		H			M					
	TS Field Assessment	C																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	B								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	B													H		M											
	new photo estimation	B													H	M							H			H		
	ground sampling (timber)	B													H	H	M						H			H		
	ground sampling (full VRI)	B													H										M			
Growth and Yield	productivity assessment	C													H											H		
	growth model	C													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											

9.1.1 PRINCE GEORGE FOREST DISTRICT

Table 9.1.1 - 2: Inventory Status and Need by Business Driver

Region: Prince George	District: Prince George		Business Driver																									
			International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	**Type (Intensity)**	**Status**	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management Strategy	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	C											M	M	M		L						H					
	range cultural inventory	C									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity	B								L	L		L	L	L	L	L			L	M							
	recreation features	C								L	L		L	L	L	L	L			L	H		H	H			M	M
Terrain (Stability) Mapping	Level E/D/C reconnaisance	C								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	C								L				L	L	L		H		H			M					
	TS Field Assessment	C																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	B								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	B													H		M											
	new photo estimation	B													H	M							H			H		
	ground sampling (timber)	B													H	H	M						H			H		
	ground sampling (full VRI)	B													H										M			
Growth and Yield	productivity assessment	C													H											H		
	growth model	C													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											

Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						
Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						
Rare Ecosystem Inventory	REI	n/a																										
BCF: Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

9.1.2 ROBSON VALLEY FOREST DISTRICT

Table 9.1.2 - 2: Inventory Status and Need by Business Driver

			Business Driver																									
Region: Prince George	District: Robson Valley		International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	**Type (intensity)**	**Status**	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features, Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		H								
Range	range ecosystem inventory	C																										
	range cultural inventory	C																										
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity									L	L		L	L	L	L	L			L	M							
	recreation features									L	L		L	L	L	L	L			L	H		H	H			M	M
Terrain (Stability) Mapping	Level E/D/C reconnaisance	C								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	C								L				L	L	L		H		H			M					
	TS Field Assessment	C																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	B								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	B													H		M											
	new photo estimation	B													H	M							H			H		
	ground sampling (timber)	B													H	H	M						H			H		
	ground sampling (full VRI)	B													H										M			
Growth and Yield	productivity assessment	C													H											H		
	growth model	C													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						

Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						
Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						
Rare Ecosystem Inventory	REI	n/a																										
BCF: Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	Intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm.w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

9.1.2 ROBSON VALLEY FOREST DISTRICT

Table 9.1.2 - 2: Inventory Status and Need by Business Driver

Region: Prince George	District: Robson Valley		Business Driver																									
			International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	**Type (Intensity)**	**Status**	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		H								
Range	range ecosystem inventory	C																										
	range cultural inventory	C																										
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity									L	L		L	L	L	L	L			L	M							
	recreation features									L	L		L	L	L	L	L			L	H		H	H			M	M
Terrain (Stability) Mapping	Level E/D/C reconnaisance	C								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	C								L				L	L	L		H		H			M					
	TS Field Assessment	C																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	B								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	B													H		M											
	new photo estimation	B													H	M							H			H		
	ground sampling (timber)	B													H	H	M						H			H		
	ground sampling (full VRI)	B													H										M			
Growth and Yield	productivity assessment	C													H											H		
	growth model	C													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						

Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						
Rare Ecosystem Inventory	REI	n/a																										
BCF: Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	Intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

9.1.3 VANDERHOOF FOREST DISTRICT

Table 9.1.3 - 2: Inventory Status and Need by Business Driver

			Business Driver																									
Region: Prince George	District: Vanderhoof		International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	**Type (Intensity)**	**Status**	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features, Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	C											M	M	M		L						H					
	range cultural inventory	C									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity																											
	recreation features																											
Terrain (Stability) Mapping	Level E/D/C reconnaisance	C								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	C								L				L	L	L		H		H			M					
	TS Field Assessment	C																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	B								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	B													H		M											
	new photo estimation	B													H	M							H			H		
	ground sampling (timber)	B													H	H	M						H			H		
	ground sampling (full VRI)	B													H										M			
Growth and Yield	productivity assessment	C													H											H		
	growth model	C													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						

Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						
Rare Ecosystem Inventory	REI	n/a																										
BCF Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaissance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

9.1.3 VANDERHOOF FOREST DISTRICT

Table 9.1.3 - 2: Inventory Status and Need by Business Driver

Region: Prince George	District: Vanderhoof		Business Driver																									
			International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	**Type (Intensity)**	Status	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaissance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	C											M	M	M		L						H					
	range cultural inventory	C									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity																											
	recreation features																											
Terrain (Stability) Mapping (including Soils)	Level E/D/C reconnaisance	C								M	L			L	L	L		H		H			M					
	Level C/B/A - detailed	C								L				L	L	L		H		H			M					
	TS Field Assessment	C																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory (VRI)	depletion update	B								L	L		M	H	H	L	H					H	H		M	M		
	retrofit to VRI standards	B													H		M											
	new photo estimation	B													H	M							H			H		
	ground sampling (timber)	B													H	H	M						H			H		
	ground sampling (full VRI)	B													H										M			
Growth and Yield	productivity assessment	C													H											H		
	growth model	C													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						

Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						
Rare Ecosystem Inventory	REI	n/a																										
BCF: Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	Intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm.w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

9.1.4 FORT ST. JAMES FOREST DISTRICT

Table 9.1.4 - 2: Inventory Status and Need by Business Driver

Region: Prince George District: Fort St. James			Business Driver																									
			International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	**Type (Intensity)**	**Status**	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features, Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	C											M	M	M		L						H					
	range cultural inventory	C									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity																											
	recreation features																											
Terrain (Stability) Mapping	Level E/D/C reconnaisance	C								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	C								L				L	L	L		H		H			M					
	TS Field Assessment	C																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	B								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	B													H		M											
	new photo estimation	B													H	M							H			H		
	ground sampling (timber)	B													H	H	M						H			H		
	ground sampling (full VRI)	B													H										M			
Growth and Yield	productivity assessment	C													H											H		
	growth model	C													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						

Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						
Rare Ecosystem Inventory	REI	n/a																										
BCF. Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	Intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

9.1.4 FORT ST. JAMES FOREST DISTRICT

Table 9.1.4 - 2: Inventory Status and Need by Business Driver

Region: Prince George	District: Fort St. James		Business Driver																									
			International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	**Type (Intensity)**	**Status**	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	C											M	M	M		L						H					
	range cultural inventory	C									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity																											
	recreation features																											
Terrain (Stability) Mapping	Level E/D/C reconnaisance	C								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	C								L				L	L	L		H		H			M					
	TS Field Assessment	C																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	B								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	B													H		M											
	new photo estimation	B													H	M							H			H		
	ground sampling (timber)	B													H	H	M						H			H		
	ground sampling (full VRI)	B													H										M			
Growth and Yield	productivity assessment	C													H											H		
	growth model	C													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						

Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						
Rare Ecosystem Inventory	REI	n/a																										
BCF: Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm.w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

9.1.5 MACKENZIE FOREST DISTRICT

Table 9.1.5 - 2: Inventory Status and Need by Business Driver

			Business Driver																									
Region: _Prince George, District: Mackenzie			International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	**Type (Intensity)**	**Status**	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features, Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	c								l	m		n/a	m	h	m	m						h		l			
	AIS	b															m						h	h	l			
Forest Health	forest health assessment	b												h	h	h							h			h		
	pest incidence surveys	b													h									h		h		
Karst	reconnaisance	n/d								l			n/a			l	l				l		l					
	planning	n/d																		l	l		l					
Range	range ecosystem inventory	c											n/a	m	l		l						m					
	range cultural inventory	c									l												m					
Recreation	visual landscape inventory	c								l			n/a	h	h	h	m			h	m		h	h			h	h
	recreation opportunity	a								l	m		n/a	m	l	m	l			l	m							
	recreation features	a								l	m		n/a	m	l	m	m			m	m		h	h			m	m
Terrain (Stability) Mapping	Level E/D/C reconnaisance	b								h	m			h	h	h		h		l			h					
(including Soils)	Level C/B/A - detailed	b								h				h	h	h		h		l			h					
	TS Field Assessment	b																m/h						h		h		
Traditional Use	TU sites	c								m	m		n/a	m	m	m							m					
Vegetation Resources Inventory	depletion update	a								h	h		n/a	h	h	h	h					h	h		h	h		
(VRI)	retrofit to VRI standards	n/d													h	h	h						h					
	new photo estimation	n/d													h	h							h			h		
	ground sampling (timber)	n/d													h	h	h						h			h		
	ground sampling (full VRI)	n/d							n/a						h	h									m			
Growth and Yield	productivity assessment	c													h											h		
	growth model	c													h											h		
Ecoregion Mapping	ecoregion interpretations	a																										
Broad Ecosystem Inventory	BEI	b							n/a	m	l	m		m	m		m											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	c							n/a	m			n/a	m	m	m	m											
	PEM - Level 2 (detailed)	c								h			n/a	h	h	h	h					h						
Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/a							n/a				n/a															

Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						
Rare Ecosystem Inventory	REI	n/a																										
BCF Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

9.1.5 MACKENZIE FOREST DISTRICT

Table 9.1.5 - 2: Inventory Status and Need by Business Driver

Region: _Prince George, District: Mackenzie			Business Driver																									
			International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	**Type (Intensity)**	**Status**	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features, Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	c								l	m		n/a	m	h	m	m						h		l			
	AIS	b															m						h	h	l			
Forest Health	forest health assessment	b												h	h	h							h			h		
	pest incidence surveys	b													h									h		h		
Karst	reconnaisance	n/d								l			n/a			l	l				l		l					
	planning	n/d																		l	l		l					
Range	range ecosystem inventory	c											n/a	m	l		l						m					
	range cultural inventory	c									l												m					
Recreation	visual landscape inventory	c								l			n/a	h	h	h	m			h	m		h	h			h	h
	recreation opportunity	a								l	m		n/a	m	l	m	l			l	m							
	recreation features	a								l	m		n/a	m	l	m	m			m	m		h	h			m	m
Terrain (Stability) Mapping (including Soils)	Level E/D/C reconnaisance	b								h	m			h	h	h		h		l			h					
	Level C/B/A - detailed	b								h				h	h	h		h		l			h					
	TS Field Assessment	b																m/h						h		h		
Traditional Use	TU sites	c								m	m		n/a	m	m	m							m					
Vegetation Resources Inventory (VRI)	depletion update	a								h	h		n/a	h	h	h	h					h	h		h	h		
	retrofit to VRI standards	n/d													h	h	h						h					
	new photo estimation	n/d													h	h							h			h		
	ground sampling (timber)	n/d													h	h	h						h			h		
	ground sampling (full VRI)	n/d							n/a						h	h									m			
Growth and Yield	productivity assessment	c													h											h		
	growth model	c													h											h		
Ecoregion Mapping	ecoregion interpretations	a																										
Broad Ecosystem Inventory	BEI	b							n/a	m	l	m		m	m		m											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	c							n/a	m			n/a	m	m	m	m											
	PEM - Level 2 (detailed)	c								h			n/a	h	h	h	h					h						
Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/a							n/a				n/a															

	TEM - Level 5 (reconnaissance)	n/a																										
	TEM - Level 4 (intensive)	n/a																										
Rare Ecosystem Inventory	REI	c										h																
BCF: Fish and Fish Habitat	summary (FISS)	c							n/a	h	h	h		h	h		l		h	h			h					
	overview (1:50,000)	c								m	m	m		m			l											
	reconnaisance (1:20,000)	c										h			h		l	h	h	h			h		h	h	h	h
	intensive (1:5,000)	c										h						l	l	l				h			l	l
	species / population inv	c								l		l	n/a	l			l			l								
	lake classification	n/d												m			l	m	m				m	m				
Water Quality/Quantity	water quantity inventory	n/a							n/a				n/a	l														
	water use inventory (comm w/s)	b											n/a	m	l	l	l	l					h	h			h	h
	water quality inventory	n/d											n/a	h	l	h	l	h							h			
Wildlife and Wildlife Habitat	BEI interpretations	n/d							n/a	l	l	l		l	l	l	l											
	TEM/PEM interpretations	c								m		h		h		h	h			h		h						
	species presence	b							n/a	h		h	n/a	h	h	h						h						
	species relative abundance	b										h	n/a									h						
	species absolute abundance	c																										
	rare & endangered species	c							n/a	h	h	h	n/a	h	h	h	h		h	h		h	h	h	h	h		

9.1.6 DAWSON CREEK FOREST DISTRICT

Table 9.1.6 - 2: Inventory Status and Need by Business Driver

Region: ______ District: ______			Business Driver																									
			International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	**Type (Intensity)**	**Status**	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features, Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	C	L	L	H	M	L	L	H	H	H	L	H	H	M	H	H	L	L	H	H	L	H	H	M	L	H	L
	AIS	N/D	L	L	H	M	L	L	H	H	H	L	H	H	M	H	H	L	L	H	H	L	H	H	M	L	H	L
Forest Health	forest health assessment	C	L	L	L	L	L	M	L	L	L	L	L	L	H	L	L	L	L	L	L	L	H	H	L	H	L	L
	pest incidence surveys	C	L	L	L	L	L	M	L	L	L	L	L	L	H	L	L	L	L	L	L	L	H	H	L	H	L	L
Karst	reconnaisance	N/D	L	L	L	L	L	L	L	H	L	L	H	H	M	M	M	L	L	H	H	L	M	M	L	L	L	L
	planning	N/D	L	L	L	L	L	L	L	H	L	L	H	H	M	M	M	L	L	H	H	L	M	M	L	L	L	L
Range	range ecosystem inventory	C	L	L	L	L	L	L	L	M	L	L	L	H	L	H	H	L	L	L	L	L	H	H	H	M	L	L
	range cultural inventory	C	L	L	L	L	L	L	L	M	L	L	L	H	L	H	H	L	L	L	L	L	H	H	H	M	L	L
Recreation	visual landscape inventory	C	L	L	L	L	L	L	L	H	M	L	H	H	H	H	H	L	L	H	H	L	H	H	L	L	L	M
	recreation opportunity	C	L	L	L	L	L	L	L	H	M	L	H	H	L	M	H	L	L	M	M	L	M	M	L	L	L	L
	recreation features	C	L	L	L	L	L	L	L	H	M	L	H	H	M	M	H	L	L	H	H	L	M	M	L	L	L	L
Terrain (Stability) Mapping	Level E/D/C reconnaisance	B	L	L	L	L	L	L	M	L	L	L	M	M	H	M	M	L	L	L	L	L	H	H	L	L	H	H
(including Soils)	Level C/B/A - detailed	B	L	L	L	L	L	L	M	L	L	L	M	M	H	M	M	L	L	L	L	L	H	H	L	L	H	H
	TS Field Assessment	B	L	L	L	L	L	L	M	L	L	L	M	M	H	M	M	L	L	L	L	L	H	H	L	L	H	H
Traditional Use	TU sites	C	L	L	H	M	L	L	H	H	H	L	H	H	M	H	H	L	L	H	H	L	H	H	M	L	H	L
Vegetation Resources Inventory	depletion update	C	L	H	M	L	H	H	H	H	H	M	H	H	H	H	H	H	H	H	H	H	H	H	H	L	L	L
(VRI)	retrofit to VRI standards	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	new photo estimation	C	H	M	M	M	H	H	H	H	H	H	H	H	H	H	H	L	M	H	L	H	H	H	H	L	L	L
	ground sampling (timber)	C	H	M	M	M	H	H	H	H	H	M	H	M	H	H	H	L	M	H	L	M	H	H	H	L	L	L
	ground sampling (full VRI)	C	H	M	M	M	H	H	H	H	H	M	H	M	H	H	H	L	M	H	L	M	H	H	H	L	L	L
Growth and Yield	productivity assessment	C	L	L	L	L	L	M	H	L	L	L	L	M	H	M	H	L	L	L	L	L	L	L	L	L	L	L
	growth model	C	L	L	L	L	L	M	H	L	L	L	L	M	H	M	H	L	L	L	L	L	L	L	L	L	L	L
Ecoregion Mapping	ecoregion interpretations	B	H	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	M	M	M	L	L	L	L
Broad Ecosystem Inventory	BEI	C	H	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	M	M	M	L	L	L	L
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	h	H	H	L	L	L	L
	PEM - Level 2 (detailed)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	H	H	H	L	L	L	L
Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	H	H	H	L	L	L	L

	TEM - Level 5 (reconnaissance)	n/a																										
	TEM - Level 4 (intensive)	n/a																										
Rare Ecosystem Inventory	REI	c										h																
BCF Fish and Fish Habitat	summary (FISS)	c							n/a	h	h	h		h	h		l		h	h			h					
	overview (1:50,000)	c								m	m	m		m			l											
	reconnaisance (1:20,000)	c										h			h		l	h	h	h			h		h	h	h	h
	Intensive (1:5,000)	c										h						l	l	l				h			l	l
	species / population inv	c								l		l	n/a	l			l			l								
	lake classification	n/d												m			l	m	m				m	m				
Water Quality/Quantity	water quantity inventory	n/a							n/a				n/a	l														
	water use inventory (comm.w/s)	b											n/a	m	l	l	l	l					h	h			h	h
	water quality inventory	n/d											n/a	h	l	h	l	h							h			
Wildlife and Wildlife Habitat	BEI interpretations	n/d							n/a	l	l	l		l	l	l	l											
	TEM/PEM interpretations	c								m		h		h		h	h			h		h						
	species presence	b							n/a	h		h	n/a	h	h	h						h						
	species relative abundance	b										h	n/a									h						
	species absolute abundance	c																										
	rare & endangerd species	c							n/a	h	h	h	n/a	h	h	h	h		h	h		h	h	h	h	h		

9.1.6 DAWSON CREEK FOREST DISTRICT

Table 9.1.6 - 2: Inventory Status and Need by Business Driver

Region: ________ District: ________			Business Driver																												
			International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	**Type (Intensity)**	**Status**	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	C	L	L	H	M	L	L	H	H	H	L	H	H	M	H	H	L	L	H	H	L	H	H	M	L	H	L
	AIS	N/D	L	L	H	M	L	L	H	H	H	L	H	H	M	H	H	L	L	H	H	L	H	H	M	L	H	L
Forest Health	forest health assessment	C	L	L	L	L	L	M	L	L	L	L	L	L	H	L	L	L	L	L	L	L	H	H	L	H	L	L
	pest incidence surveys	C	L	L	L	L	L	M	L	L	L	L	L	L	H	L	L	L	L	L	L	L	H	H	L	H	L	L
Karst	reconnaisance	N/D	L	L	L	L	L	L	L	H	L	L	H	H	M	M	M	L	L	H	H	L	M	M	L	L	L	L
	planning	N/D	L	L	L	L	L	L	L	H	L	L	H	H	M	M	M	L	L	H	H	L	M	M	L	L	L	L
Range	range ecosystem inventory	C	L	L	L	L	L	L	L	M	L	L	L	H	L	H	H	L	L	L	L	L	H	H	H	M	L	L
	range cultural inventory	C	L	L	L	L	L	L	L	M	L	L	L	H	L	H	H	L	L	L	L	L	H	H	H	M	L	L
Recreation	visual landscape inventory	C	L	L	L	L	L	L	L	H	M	L	H	H	H	H	H	L	L	H	H	L	H	H	L	L	L	M
	recreation opportunity	C	L	L	L	L	L	L	L	H	M	L	H	H	L	M	H	L	L	M	M	L	M	M	L	L	L	L
	recreation features	C	L	L	L	L	L	L	L	H	M	L	H	H	M	M	H	L	L	H	H	L	M	M	L	L	L	L
Terrain (Stability) Mapping (including Soils)	Level E/D/C reconnaisance	B	L	L	L	L	L	L	M	L	L	L	M	M	H	M	M	L	L	L	L	L	H	H	L	L	H	H
	Level C/B/A - detailed	B	L	L	L	L	L	L	M	L	L	L	M	M	H	M	M	L	L	L	L	L	H	H	L	L	H	H
	TS Field Assessment	B	L	L	L	L	L	L	M	L	L	L	M	M	H	M	M	L	L	L	L	L	H	H	L	L	H	H
Traditional Use	TU sites	C	L	L	H	M	L	L	H	H	H	L	H	H	M	H	H	L	L	H	H	L	H	H	M	L	H	L
Vegetation Resources Inventory (VRI)	depletion update	C	L	H	M	L	H	H	H	H	H	M	H	H	H	H	H	H	H	H	H	H	H	H	H	L	L	L
	retrofit to VRI standards	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	new photo estimation	C	H	M	M	M	H	H	H	H	H	H	H	H	H	H	H	L	M	H	L	H	H	H	H	L	L	L
	ground sampling (timber)	C	H	M	M	M	H	H	H	H	H	M	H	M	H	H	H	L	M	H	L	M	H	H	H	L	L	L
	ground sampling (full VRI)	C	H	M	M	M	H	H	H	H	H	M	H	M	H	H	H	L	M	H	L	M	H	H	H	L	L	L
Growth and Yield	productivity assessment	C	L	L	L	L	L	M	H	L	L	L	L	M	H	M	H	L	L	L	L	L	L	L	L	L	L	L
	growth model	C	L	L	L	L	L	M	H	L	L	L	L	M	H	M	H	L	L	L	L	L	L	L	L	L	L	L
Ecoregion Mapping	ecoregion interpretations	B	H	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	M	M	M	L	L	L	L
Broad Ecosystem Inventory	BEI	C	H	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	M	M	M	L	L	L	L
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	H	H	H	L	L	L	L
	PEM - Level 2 (detailed)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	H	H	H	L	L	L	L
Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	H	H	H	L	L	L	L

	TEM - Level 5 (reconnaissance)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	H	H	H	L	L	L	L
	TEM - Level 4 (intensive)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	H	H	H	L	L	L	L
Rare Ecosystem Inventory	REI	C	L	L	L	L	L	L	L	H	L	H	M	M	M	H	H	L	L	L	L	H	H	H	L	L	L	L
BCF: Fish and Fish Habitat	summary (FISS)	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	overview (1:50,000)	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	reconnaisance (1:20,000)	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	Intensive (1:5,000)	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	species / population inv	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	lake classification	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
Water Quality/Quantity	water quantity inventory	C	L	L	L	L	L	M	L	M	L	L	M	H	M	H	M	H	H	L	H	L	H	H	H	L	M	H
	water use inventory (comm w/s)	C	L	L	L	L	L	M	L	M	L	L	M	H	M	H	M	H	H	L	H	L	H	H	H	L	M	H
	water quality inventory	C	L	L	L	L	L	M	L	M	L	L	M	H	M	H	M	H	H	L	H	L	H	H	H	L	M	H
Wildlife and Wildlife Habitat	BEI interpretations	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	TEM/PEM interpretations	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	species presence	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	species relative abundance	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	species absolute abundance	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	rare & endangered species	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
Terrain Surficial Geology Mapping		C	M	M	M	L	M	L	L	H	L	H	M	H	H	L	H	L	L	L	L	H	H	M	L	L	H	H

9.1.7 FORT ST. JOHN FOREST DISTRICT

Table 9.1.7 - 2: Inventory Status and Need by Business Driver

Region: Prince George	District: Fort St. John		Business Driver International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	**Type (Intensity)**	**Status**	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features, Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	B											M	M	M		L						H					
	range cultural inventory	B									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity	C								H	M		n/a	H	L	H	H			M	M							
	recreation features	C								H	M		n/a	H	M	H	H			H	H		M	M			L	L
Terrain (Stability) Mapping	Level E/D/C reconnaisance	N/d								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	N/d								L				L	L	L		H		H			M					
	TS Field Assessment	N/d																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	C								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	C													H		M											
	new photo estimation	C													H	M							H			H		
	ground sampling (timber)	C													H	H	M						H			H		
	ground sampling (full VRI)	N/d													H										M			
Growth and Yield	productivity assessment	N/d													H											H		
	growth model	N/d													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						

	TEM - Level 5 (reconnaissance)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	H	H	H	L	L	L	L
	TEM - Level 4 (intensive)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	H	H	H	L	L	L	L
Rare Ecosystem Inventory	REI	C	L	L	L	L	L	L	L	H	L	H	M	M	M	H	H	L	L	L	L	H	H	H	L	L	L	L
BCF: Fish and Fish Habitat	summary (FISS)	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	overview (1:50,000)	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	reconnaisance (1:20,000)	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	Intensive (1:5,000)	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	species / population inv	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	lake classification	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
Water Quality/Quantity	water quantity inventory	C	L	L	L	L	L	M	L	M	L	L	M	H	M	H	M	H	H	L	H	L	H	H	H	L	M	H
	water use inventory (comm.w/s)	C	L	L	L	L	L	M	L	M	L	L	M	H	M	H	M	H	H	L	H	L	H	H	H	L	M	H
	water quality inventory	C	L	L	L	L	L	M	L	M	L	L	M	H	M	H	M	H	H	L	H	L	H	H	H	L	M	H
Wildlife and Wildlife Habitat	BEI interpretations	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	TEM/PEM interpretations	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	species presence	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	species relative abundance	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	species absolute abundance	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	rare & endangered species	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
Terrain Surficial Geology Mapping		C	M	M	M	L	M	L	L	H	L	H	M	H	H	L	H	L	L	L	L	H	H	M	L	L	H	H

9.1.7 FORT ST. JOHN FOREST DISTRICT

Table 9.1.7 - 2: Inventory Status and Need by Business Driver

Region: Prince George	District: Fort St. John		Business Driver International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	**Type (Intensity)**	**Status**	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	B											M	M	M		L						H					
	range cultural inventory	B									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity	C								H	M		n/a	H	L	H	H			M	M							
	recreation features	C								H	M		n/a	H	M	H	H			H	H		M	M			L	L
Terrain (Stability) Mapping	Level E/D/C reconnaisance	N/d								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	N/d								L				L	L	L		H		H			M					
	TS Field Assessment	N/d																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	C								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	C													H		M											
	new photo estimation	C													H	M							H			H		
	ground sampling (timber)	C													H	H	M						H			H		
	ground sampling (full VRI)	N/d													H										M			
Growth and Yield	productivity assessment	N/d													H											H		
	growth model	N/d													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H	*					

Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						
Rare Ecosystem Inventory	REI	n/a																										
BCF: Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	Intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm.w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

9.1.8 FORT NELSON FOREST DISTRICT

Table 9.1.8 - 2: Inventory Status and Need by Business Driver

			Business Driver																									
Region: Prince George	District: Fort Nelson		International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	**Type (Intensity)**	**Status**	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features, Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	C											M	M	M		L						H					
	range cultural inventory	C									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity	C								H	M		n/a	L	M	L	H			M	M							
	recreation features	C								H	M		n/a	L	M	L	H			H	H		H	H			L	L
Terrain (Stability) Mapping	Level E/D/C reconnaisance	N/d								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	N/d								L				L	L	L		H		H			M					
	TS Field Assessment	N/d																H						L		L		
Traditional Use	TU sites	C								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	C								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	N/d													H		M											
	new photo estimation	N/d													H	M							H			H		
	ground sampling (timber)	N/d													H	H	M						H			H		
	ground sampling (full VRI)	N/d													H										M			
Growth and Yield	productivity assessment	N/d													H											H		
	growth model	N/d													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						

Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L				L										
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L											L					
Rare Ecosystem Inventory	REI	n/a																										
BCF: Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	Intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

9.1.8 FORT NELSON FOREST DISTRICT

Table 9.1.8 - 2: Inventory Status and Need by Business Driver

			Business Driver																									
Region: Prince George	District: Fort Nelson		International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	**Type (Intensity)**	**Status**	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	C											M	M	M		L						H					
	range cultural inventory	C									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity	C								H	M		n/a	L	M	L	H			M	M							
	recreation features	C								H	M		n/a	L	M	L	H			H	H		H	H			L	L
Terrain (Stability) Mapping	Level E/D/C reconnaisance	N/d								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	N/d								L				L	L	L		H		H			M					
	TS Field Assessment	N/d																H						L		L		
Traditional Use	TU sites	C								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	C								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	N/d													H		M											
	new photo estimation	N/d													H	M							H			H		
	ground sampling (timber)	N/d													H	H	M						H			H		
	ground sampling (full VRI)	N/d													H										M			
Growth and Yield	productivity assessment	N/d													H											H		
	growth model	N/d													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						

Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						
Rare Ecosystem Inventory	REI	n/a																										
BCF: Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						
Rare Ecosystem Inventory	REI	n/a																										
BCF: Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	Intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm.w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

9.2 REGIONAL ASSESSMENT OF INVENTORY STATUS FOR MANAGEMENT UNITS

9.2.1 FOREST HEALTH

Forest Health inventories throughout the region are either unavailable, incomplete, or must be upgraded frequently due the dynamic nature of the pest species being inventories. This is particularly the case concerning the four species of bark beetle, and two year spruce budworm, all of which are at epidemic levels at various locations in the region (see Section 4).

Managed stand forest health inventory status is also inadequate, especially concerning decision support data for managing lodgepole pine stands infected by any of the three species of stem rust. Stem rust hazard maps are feasible, relatively inexpensive inventory products that are needed within all three SubBoreal TSA's in the region.

Hazard maps of several root rot pathogens (*Inonotus tomentosis*, and *Armillaria ostoyae*) species is an potentially important management support. Work has been limited due to lack of funds, and is focussed within only two Forest Districts.

9.2.2 VISUAL LANDSCAPE INVENTORIES

The status of visual landscape inventories throughout the Prince George Forest Region is poor, as can be inferred from the scope of the viewscape inventory gaps identified in Table 9.2.2. This is a reflection of a lack of or outdated field inventory mapping for a large portion of the visually sensitive/scenic areas identified in all forest districts (Note: three Forest Districts are not yet included in Table 9.2.2, but require inventory updates as shown in Table 9.2.1).

Without accurate and reliable visual landscape inventories, it is difficult to determine societal values and objectives and have proper input into many of the business drivers identified previously in Tables 9.1.1 to 8. For example, uncertainties related to unrefined and outdated visual landscape inventories make the LRMP recommendations of identifying, managing, and protecting the integrity of important viewscapes for commercial and non-commercial recreation, making scenic areas known, and establishing VQOs difficult.

This knowledge gap not only impacts timber supply and the implementation of the LRMP recommendations, but render operational planning difficult with the risk of creating adverse visual impacts and negatively affecting visual, recreation and tourism values in the short-term.

To address this issue, detailed Visual Landscape Inventories would provide the improved knowledge base necessary to implement the LRMP recommendations and increase certainty about the effects of strategic decisions on timber supply (TSR3). In addition, detailed up-to-date VLIs would better meet Forest Certification principles.

The following table provides the number and cost estimate for carrying out new and updating old visual landscape inventories to the new standards in each district for the next three years.

Table 9.2.1 Overall Cost Estimate for Completing New/Updating Old Visual Landscape Inventories.

Forest District	Number of Scenic Areas requiring inventory update in the next 3 years	Cost Estimate ($)
Dawson Creek	10	124,000
Fort Nelson	3	85,000
Fort St. James	14	210,000
Fort St. John	3	80,000
Mackenzie	10	130,000
Prince George	16	250,000
Robson Valley	12	206,000
Vanderhoof	12	200,000
Grand Total	**83**	**1,285,000**

9.2.3 RECREATION OPPORTUNITIES AND FEATURES INVENTORIES

Management unit LRMP's specify the following management direction for developing recreation and tourism opportunities:

- Creatr more recreation trails and sites in response to demand where compatible with other uses.
- Discourage the impacts from recreationalists on the environment
- Develop management plans that reduce conflicts between recreation users.
- Identify and classify lakes for recreation, in consultation with the public.
- Consider roaded recreation in access management planning .

Despite this direction, there is considerable risk that these non-timber resources will not be adequately managed in several Forest Districts due the inadequate or incomplete state of recreational inventories. Specifically, uncertainties related to outdated Recreation Opportunity Spectrum (ROS) inventories, and Recreation Feature Inventories (RFI), make it, or impossible to implement LRMP and higher level recreation.

This forest level issue involves the balancing of multiple resource objectives. Inventory data, together with user survey data, is the basic information required to ensure the sought for balance.. Once analysed, a management strategy can be designed to conserve and protect key resources, and fulfill recreation management objectives

The ROS and RFI for the Prince George, Dawson Creek, Fort Nelson Forest Districts have not been updated since1994. Using these outdated inventories risks not adequately accounting for features that have been identified recently, or ROS classification criterion which have changed since 1994 (i.e. distance from road, evidence of humans, motorized use, and solitude).

Updating these recreation inventories would ensure that government agencies are able to identify a diverse range of recreation values and uses, and support strategic and tactical planning. Improved recreation resource data is also crucial to the maintenance and enhancement of ecological integrity in areas subject to recreation use. Key knowledge is required to define acceptable levels of appropriate recreation feature use, and identifying and distinguishing commercial and non-commercial recreation use opportunities.

Table 9.2.2 Key Recreation-Visual Landscape Management Issues and Investment Needs, by Forest District, as specified in TSR's and LRMPS.[50]

Key Issues	Source of Issues	Strategic Recreation-Visual Management Knowledge Gap	Geographic Area	VLI/KSA/EVQO Status (if applicable)[51]	Priority[52]
Prince George Forest District					
Uncertainties related to unrefined and outdated visual landscape inventories (VLIs) make the LRMP recommendations of identifying scenic areas, managing visual quality, developing and establishing VQOs in consultation with the public and through landscape unit level planning processes difficult.	LRMP	The LRMP Table made specific recommendations on the high priority areas for which detailed visual landscape inventories should be conducted and VQOs established. The district subsequently prioritized these project areas based on the criteria listed below. Note: The Parsnip River was listed only as requiring a broad inventory, which was done in 1999 but is yet to be known as scenic area.	**Parsnip River**	Broad/Not KSA/No EVQO	L
			Firth Lake	Broad/KSA/Rec. EVQO	M
			Tacheeda Lakes	Detailed (partial) /KSA/Rec. EVQO	M
			Carp Lake	Broad/KSA/Rec. EVQO	M
			Summit Lake	Broad/KSA/Rec. EVQO	M
			Davie Lake	Broad/KSA/Rec. EVQO	M
			Kerry Lake	Detailed/KSA/Rec. EVQO	M
			McLeod Lake	Detailed/KSA/Rec. EVQO	M
			Crooked River	Broad/KSA/Rec. EVQO	M

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[50] Any other recreation/visual resource management issues and knowledge gaps identified in District Recreation Plans, TFL MPs, LU plans, Historic Trail MPs, Cave MPs, etc. will be integrated into the RMP at a later date.

[51] Broad = VLI mapped at 1:250,000; Detailed = VLI mapped at 1:50,000; No VLI = No VLI mapping available at any scale; KSA = Current Known Scenic Area and supported by LRMP;
rec. KSA = Recommended by LRMP and/or MoF staff to be made known as "scenic areas" by DM; no KSA = Currently not a KSA (i.e. Visually Sensitive Area only) and not recommended by LRMP for formal KSA status but resource development activities should consider visual values; EVQO = Established VQOs currently in place; rec. EVQO = Recommended by LRMP and/or MoF for VQO establishment by DM; no EVQO = No established VQO currently in place and not recommended by LRMP or MoF for formal establishment.

[52] The following guidelines were used to assess regional or district priorities for each project area:
High (H): No VLI or outdated broad or detailed VLI requiring immediate update at 1:50,000 for strategic and/or operational planning; and/or geographic area under heavy development pressure; and/or issue or data gap specifically identified by TSR/LRMP; and/or high level of public concern for visual quality/impact in the area.
Medium (M): Broad or detailed VLI in place but requiring update within the next 5 years; and/or moderate level of development pressure in or around the geographic area for the next 5 years; and/or issue or data gap generally referred to in TSR/LRMP; and/or moderate level of public concern for visual quality/impact in the area.
Low (L): Broad or detailed data in place but requiring update beyond the next 5 years; and/or new and up-to-date VLI in place; and/or low or no development pressure in or around the geographic for the next 5 years; and/or issue or data gap generally referred to in TSR/LRMP; and/or low level of public concern for visual quality/impact in the area. Note: priority ranking of viewscapes in all but the Prince George Forest District remain to be completed.

			Highway 97 N	Detailed/KSA/Rec. EVQO	L
			Highway 97 S	Broad/KSA/Rec. EVQO	H
			Dahl Lake	Broad/KSA/Rec. EVQO	M
			Norman Lake	Broad/KSA/Rec. EVQO	M
			Bednesti Lake	Detailed/KSA/EVQO	L
			Nechako River	Broad/KSA/Rec. EVQO	M
			Highway 16 E	Detailed/KSA/EVQO	L
			Highway 16 W	Broad/KSA/Rec. EVQO	H
			Green Mountain	Detailed/KSA/EVQO	L
			Blackwater River	Detailed/KSA/EVQO	L
			Alexander Mackenzie Heritage Trail	Detailed/KSA/EVQO	L
Vanderhoof Forest District Uncertainties related to unrefined and outdated visual landscape inventories (VLIs) make the LRMP recommendations for managing visual values in scenic areas and establishing Visual Quality Objectives (VQOs) difficult. This lack of up-to-date VLI data has also the potential of unnecessarily constraining timber access and supply (TSRs) in the TSA in addition to making the operational planning process uncertain.	LRMP (January 1997 approved version) TSR2 Data Package Expert knowledge	The LRMP includes a General Management Direction (GMD) dealing with the importance of managing scenic quality for the public and tourism industry. The LRMP recommends specific scenic areas in RMZs to be planned and managed with established VQOs and specific visually sensitive areas to be managed without timber supply constraining VQOs i.e. as "scenic areas without established VQOs". Many areas are also listed as requiring "local area plans" integrating visual and other values. None of these areas have up-to-date detailed VLIs in place. The LRMP recommendations have also been complemented with additional visually sensitive areas historically being managed for visual values as part of developing the Data Package for the TSR2	**Highway 27 Corridor**	Broad/rec. KSA/rec. EVQO	
			West End of Nechako - Range	Broad/rec. KSA/rec. EVQO	
			Knewstubb Lake	Broad/rec. KSA/rec. EVQO	
			Nulki Hills	Broad/rec. KSA/rec. EVQO	
			East flank Sinkut Mtn.	Broad/rec. KSA/rec. EVQO	
			Cluculz Lake	Broad/rec. KSA/rec. EVQO	
			Nulki Lake	Broad/rec. KSA/rec. EVQO	
			Tachick Lake	Broad/rec. KSA/rec. EVQO	
			Kenny Dam Road	Broad/rec. KSA/no EVQO	
			North slopes Fawnie Range	Broad/rec. KSA/rec. EVQO	
			Suscha Lake	Broad/rec. KSA/rec. EVQO	
			Suscha Creek Falls	Broad/rec. KSA/rec. EVQO	
			Endako Mine Road	Broad/rec. KSA/rec. EVQO	

		process. Identifying visual resource values, establishing VQOs, and using this information in planning and visual design require up-to-date visual landscape inventory (VLI) data. Most of the viewscapes identified in the LRMP, TSR, and from expert knowledge (see next column) are currently inventoried broadly at 1:250,000 and although there exists a few detailed VLI at 1:50,000, they are outdated. In addition, broad VLIs do not take into account the screening effect found in the field by vegetation and topography, which has shown to unnecessarily inflate the size of areas mapped as being visually sensitive. Many of the areas broadly inventoried are recommended for VQO establishment which is not the recommended scale for establishing VQOs due to area overestimation problem explained above. This knowledge gap not only impacts timber supply and the implementation of the LRMP recommendations, but render operational planning difficult with the risk of creating adverse visual impacts and negatively affecting visual, recreation and tourism values in the short-term and long term. To address these issues, detailed VLIs would provide the improved knowledge base necessary to implement the LRMP recommendations and increase certainty about the effects of strategic decisions on timber supply (TSR3) and greatly improve the operational planning process. In	**North shore Francois Lake**	Broad/rec. KSA/rec. EVQO		
			Francois Lake Road	Broad/rec. KSA/rec. EVQO		
			Glennanan Road	Broad/rec. KSA/rec. EVQO		
			Telegraph Trail (road portions)	Broad/rec. KSA/rec. EVQO		
			North shore Fraser Lk.	Broad/rec. KSA/rec. EVQO		
			Peta Lake	Broad/rec. KSA/rec. EVQO		
			Top Lake North	Broad/rec. KSA/rec. EVQO		
			Fraser Mountain	Broad/rec. KSA/rec. EVQO		
			Red Mountain - (Deserter Peak)	Broad/rec. KSA/rec. EVQO		
			Deserter Lake	Broad/rec. KSA/rec. EVQO		
			Stern Lake	Broad/rec. KSA/rec. EVQO		
			Stellako River	Broad/rec. KSA/rec. EVQO		
			Nithi Mountain (southwest flank)	Broad/rec. KSA/no EVQO		
			South Nithi Valley	Broad/rec. KSA/rec. EVQO		
			Nechako River	Broad/rec. KSA/rec. EVQO		
			Murray Lake	Broad/rec. KSA/rec. EVQO		
			Hobson Lake	Broad/rec. KSA/rec. EVQO		
			Stuart River	Broad/rec. KSA/rec. EVQO		
			North Shore Finger Lk.	Broad/rec. KSA/rec. EVQO		
			Fish Lake South	Broad/rec. KSA/rec. EVQO		
			Fish Lake North	Broad/rec. KSA/rec. EVQO		
			Grizzly Lake	Broad/rec. KSA/rec. EVQO		
			Woodcock Lake	Broad/rec. KSA/rec. EVQO		
			Cobb Lake	Broad/rec. KSA/rec. EVQO		

		addition, detailed up-to-date VLIs improve land stewardship and better meet the Forest Stewardship Council principles.	**Graveyard Lake**	Broad/rec. KSA/rec. EVQO	
			Bobtail Lake	Broad/rec. KSA/rec. EVQO	
			Chowsunkut Lake	Broad/rec. KSA/rec. EVQO	
			Greer Mountain	Broad/rec. KSA/rec. EVQO	
			Mount Hobson	Broad/rec. KSA/rec. EVQO	
			Tsacha Lake	Broad/rec. KSA/rec. EVQO	
			Naglico Hills (Tommy Lakes)	Broad/rec. KSA/rec. EVQO	
			Kuyakuz Lake	Broad/rec. KSA/rec. EVQO	
			Tatelkuz Lake	Broad/rec. KSA/rec. EVQO	
			Lucas Lake	Broad/rec. KSA/rec. EVQO	
			Brewster Lake	Broad/rec. KSA/rec. EVQO	
			Devil's Thumb/Devil's – Thumb Lake	Broad/rec. KSA/rec. EVQO	
			Casey Lake	Broad/rec. KSA/rec. EVQO	
			Cheslatta Falls	Broad/rec. KSA/no EVQO	
			Cheslatta Trail	Broad/rec. KSA/rec. EVQO	
			Duten/Gluten Lakes	Broad/rec. KSA/rec. EVQO	
			Johnson Lake/Jenyo – Lake Trail	Broad/rec. KSA/rec. EVQO	
			Fawnie Creek	Broad/rec. KSA/rec. EVQO	
			Klez Lake	Broad/rec. KSA/rec. EVQO	
			26 Mile Lake	Broad/rec. KSA/rec. EVQO	
			Patrick George Lake	Broad/rec. KSA/no EVQO	
			Louie George Lake	Broad/rec. KSA/no EVQO	
			Bitch lake	Broad/rec. KSA/no EVQO	
			Sinkut Mountain North	Broad/rec. KSA/rec. EVQO	
			Rum Cache Lake	Broad/rec. KSA/rec. EVQO	

			Fraser Lake / Stuart - Lake Pack Trail	Broad/rec. KSA/rec. EVQO	
			Moose Lake	Broad/rec. KSA/rec. EVQO	
			Secord Lake	Broad/rec. KSA/rec. EVQO	
			Johnny Lake	Broad/rec. KSA/rec. EVQO	
			Laidman Lake	Broad/rec. KSA/rec. EVQO	
			Omineca Trail	Broad/rec. KSA/rec. EVQO	
			Home Lake Trail	Broad/rec. KSA/rec. EVQO	
			Ormond Creek Trail	Broad/rec. KSA/rec. EVQO	
			Ormond Lake	Broad/rec. KSA/rec. EVQO	
			Oona Lake	Broad/rec. KSA/rec. EVQO	
			Etcho Lake	Broad/rec. KSA/rec. EVQO	
			Echo Lake	Broad/rec. KSA/rec. EVQO	
			Hogsback Lake & Telegraph Trail	Broad/rec. KSA/rec. EVQO	
			McKay Lake	Broad/rec. KSA/rec. EVQO	
			Cabin Creek Falls	Broad/rec. KSA/rec. EVQO	
			Greer Creek Falls	Broad/rec. KSA/rec. EVQO	
			Messue Wagon Road	Broad/rec. KSA/rec. EVQO	
			Blue Mountain Demo Forest	Broad/rec. KSA/rec. EVQO	
			Waterlily Trails	Broad/rec. KSA/no EVQO	
			Crystal Lakes Area	Broad/rec. KSA/no EVQO	
			East Blackwater	Broad/rec. KSA/rec. EVQO	
			River/Euchiniko Lakes	Broad/rec. KSA/rec. EVQO	
			West Blackwater/Wolf & -Naglico Lakes	Broad/rec. KSA/rec. EVQO	
			Targe Creek Corridor	Broad/rec. KSA/rec. EVQO	

			Majuba Lake **Gatcho Lake Area** **Wilderness** **Lakes/Chipmunk & -** **Ziegler Lakes**	Broad/rec. KSA/no EVQO Broad/rec. KSA/no EVQO Broad/rec. KSA/rec. EVQO	
Fort St. James Forest District Uncertainties related to unrefined and outdated visual landscape inventories (VLIs) make the LRMP recommendations of identifying, managing, and protecting the integrity of important viewscapes for commercial and non-commercial recreation, making scenic areas known, and establishing VQOs difficult.	LRMP (March 1999 Government approved version)	The LRMP provides recommendations on specific geographic areas or viewscapes within RMZs for which visual quality management is considered important when planning and designing resource development activities. In addition, the LRMP provides specific recommendations on the areas requiring VLIs and the establishment of VQOs by the DM.	**Takla Lake** (inc. Frypan Peak; Mitchell Range; Mt. Bates; Sitlika Range; Carrall Range; Mt. Bodine; Redslide Peak; Mount Lovell; Mt. Teegee; Wedge Mtn.; Pyramid Peak)	Detailed/KSA/rec. EVQ (Partial detailed VLI for Takla Lake and broad VLI for the remaining viewscapes (Part of lake viewshed within a PPA)	
This lack of up-to-date VLI data has also the potential of unnecessarily constraining timber access and supply (TSRs) in the TSA.		The LRMP also includes General Management Directions (GMD) dealing with the identification of visual management areas to manage the aesthetic characteristics of wilderness-based tourism recreation; identify visually sensitive areas and develop VQOs for the plan area; integrate visual values into resource management practices; and address the maintenance of the visual quality associated with Classified waters in resource development plans.	**Middle River** (inc. Mt. Sidney Williams)	Detailed/KSA/no EVQO	
			Sustut River (Lower)	Detailed/KSA/rec. EVQO (Adopt VQOs as proposed in Sustut LRUP)	
			Sustut River (Upper)	Broad/KSA/no EVQO (Portions within a PPA)	
			Tsayta Lake (northwest corner)	Broad/KSA/rec. EVQO (most of the viewshed within a PPA)	
		Two others GMDs specifically deal with VQOs: 1) Where established, VQOs will apply to commercial timber harvesting and should guide incidental timber cutting associated with other resource user activities, and 2) For those lakes and rivers without established VQOs, consider the potential	**Stuart Lake** (inc. Mt. Rosetti; Mt. Beals; Shass Mtn.,Mt. Nielsp)	Detailed/KSA/rec. EVQO (Detailed VLI for Stuart Lake and broad VLI for the remaining viewscapes)	

		high scenic value in resource management operations and prioritize them for the establishment of VQOs.		(West side of North Arm within a PPA)
		Identifying visual resource values, establishing VQOs, and using this information in planning and design require up-to-date visual landscape inventory (VLI) data. Most of the viewscapes identified in the LRMP (see next column) are currently inventoried broadly at 1:250,000 or although some detailed VLI at 1:50,000 do exist, they are outdated (except for Tchentlo and Chuchi Lakes currently under work).	**Trembleur Lake** (inc. Mt. Copley; Tchentsut Mtn.; Mt. Sidney Williams)	Detailed/KSA/rec. EVQO (west part of lake viewshed within a PPA)
			Grassham Lake	Broad/KSA/no EVQO
			Ogston Lake	Broad/KSA/no EVQO
			Camsell Lake	Detailed/KSA/no EVQO (Partial detailed VLI)
		The broad VLIs do not take into account the screening effect found in the field by vegetation and topography, which has shown to unnecessarily inflate the size of areas mapped as being visually sensitive. The detailed but outdated VLIs may also contribute in overestimating the size of visually sensitive areas or may underestimate them if new viewpoints have to be added or vegetative screens have been removed since the last inventory. Also, many of the areas recommended for VQO establishment are only inventoried broadly at 1:250,000, which is not the recommended scale for establishing VQOs due to area overestimation problem explained above.	**Whitefish Lake**	Broad/KSA/no EVQO
			Tezzeron Lake (inc. Chuius Mtn.)	Detailed/KSA/no EVQO
			Witch Lake	Broad/KSA/rec. EVQO
			Tchentlo Lake (inc. portions of Mitchell Range)	Detailed/KSA/rec. EVQO (New VLI to be completed during 2000 field season) (LRMP recommendation to consider the establishment of a master VQO of Retention in the immediate viewscape (shoreline) and Partial Retention within the remaining viewscapes of the lake).
		The knowledge gaps identified above not only impact timber supply and the implementation of the LRMP recommendations, but render operational planning difficult with the risk of creating adverse visual impacts and negatively affecting visual, recreation and tourism values in the short-term and long term.	**Chuchi Lake**	Detailed/KSA/rec. EVQO (New VLI to be completed during 2000 field season) (LRMP recommendation to consider the establishment of a master VQO of Retention in the

		To address these issues, detailed VLIs would provide the improved knowledge base necessary to implement the LRMP recommendations and increase certainty about the effects of strategic decisions on timber supply (TSR3). In addition, detailed up-to-date VLIs would better meet the Forest Certification principles.		immediate viewscape (shoreline) and Partial Retention within the remaining viewscapes of the lake).	
			Indata Lake	Broad/KSA/rec. EVQO (Most of the viewshed within a PPA)	
			Great Beaver Lake	Detailed/KSA/no EVQO	
			Sustut Lake	Broad/KSA/no EVQO	
			Johanson Lake	Broad/KSA/no EVQO	
			Asitka Lake	Broad/KSA/no EVQO	
			Goldway Lake & Peak	Broad/KSA/no EVQO	
			Jaw Lake	Broad/KSA/no EVQO	
			Cripple Lake	Broad/KSA/no EVQO	
			Carrier Lake	Broad/KSA/no EVQO	
			Kalder (Horseshoe) Lk.	Detailed/KSA/no EVQO	
			Ocock Lake	Broad/KSA/no EVQO	
			Pinchi Lake	Detailed/KSA/no EVQO	
			Blackburn Lake	Broad/KSA/no EVQO	
			Tachie River	Broad/KSA/no EVQO	
			Nanna Lake	Broad/KSA/no EVQO	
			Marie Lake	Broad/KSA/no EVQO	
			Butterfield Lake	Broad/KSA/no EVQO	
			Cunningham Lake	Broad/KSA/no EVQO	
				Detailed/KSA/no EVQO (North side of lake viewshed within a PPA)	
			Bolcome Lake Chain	Broad/KSA/no EVQO	
			Nation River (lower)	Broad/KSA/rec. EVQO (Completion of VLI specifically	

				recommended by LRMP) (LRMP recommendation to consider the establishment of a master VQO of Partial Retention along the viewscape of the river)	
			Kazchek Falls	Broad/KSA/no EVQO	
			Driftwood River (inc. Carrall Ridge; Centre Peak; Driftwood Range; Iktlaki Peak; Nankai Peak)	Broad/KSA/no EVQO	
			Kaza Lake(inc. Cariboo Heart Range)	Broad/KSA/no EVQO	
			Yuen Lake	Broad/KSA/no EVQO	
			Nanitsch Lake (inc. Cariboo Heart Range)	Broad/KSA/no EVQO	
			Canyon Lake	Broad/KSA/no EVQO	
			The following are current 'known scenic areas" not specifically listed in the LRMP but still requiring up-to-date VLIs to manage the visual resource:		
			28 Mile Lake	Broad/KSA/no EVQO	
			Ahdatay Lake	Broad/KSA/no EVQO	
			Airline Lake	Broad/KSA/no EVQO	

Akus Lake	Broad/KSA/no EVQO
Albert Lake	Broad/KSA/no EVQO
Axelgold Range	Broad/KSA/no EVQO
Azuklotz Lake	Broad/KSA/no EVQO
Bear Lake & River (inc. Connelly Range/Thumb)	Broad/KSA/no EVQO
Beaverlodge Lake	Broad/KSA/no EVQO
Bearverpond Lake	Broad/KSA/no EVQO
Benoit Lake	Broad/KSA/no EVQO
Bugle Lake	Detailed/KSA/no EVQO
Byrnes Lake	Broad/KSA/no EVQO
Calais Lake	Broad/KSA/no EVQO
Camp (Nilan) Lake	Broad/KSA/no EVQO
Damshilgwit Lake	Broad/KSA/no EVQO (within a PPA)
Dan Miner Lake	Broad/KSA/no EVQO
Darb Lake	Broad/KSA/no EVQO
Dargie Lake	Broad/KSA/no EVQO
Dawn Lake	Broad/KSA/no EVQO
Dem Lake	Broad/KSA/no EVQO
Dia Lake	Broad/KSA/no EVQO
Diver Lake & Peak	Broad/KSA/no EVQO
Dolphin Lake	Broad/KSA/no EVQO
Donald Lake	Broad/KSA/no EVQO
Drift Lake	Broad/KSA/no EVQO
Duti Lake (North & South)	Broad/KSA/no EVQO

			Electra Lake	Broad/KSA/no EVQO	
			Elliott Lake	Broad/KSA/no EVQO	
			Elmore Lake	Broad/KSA/no EVQO	
			Fable Lake	Broad/KSA/no EVQO	
			Foerster Lake	Broad/KSA/no EVQO	
			Fumar Creek	Broad/KSA/no EVQO (within a PPA)	
			Gidegingla Lake	Broad/KSA/no EVQO	
			Gordon Lake	Broad/KSA/no EVQO	
			Green Lake	Broad/KSA/no EVQO	
			Hatdudatehl Lake	Broad/KSA/no EVQO	
			Henning Lake	Broad/KSA/no EVQO	
			Highway 27	Broad/KSA/no EVQO	
			Humphrey Lake	Broad/KSA/no EVQO	
			Hunitlin Mountain	Broad/KSA/no EVQO	
			Inzana Lake	Detailed/KSA/no EVQO	
			Island Lake	Broad/KSA/no EVQO	
			Jenny Lake	Broad/KSA/no EVQO	
			Jumping Lake	Broad/KSA/no EVQO	
			Karena Lake	Broad/KSA/no EVQO	
			Kazchek Lake	Broad/KSA/no EVQO	
			Kelly Lake	Broad/KSA/no EVQO	
			Keppel Lake	Broad/KSA/no EVQO	
			Kettle Glaciers	Broad/KSA/no EVQO	
			Kloch Lake	Broad/KSA/no EVQO	
			Kluatantan Lakes	Broad/KSA/no EVQO	
			Kluatantan River	Broad/KSA/no EVQO	
			Kluayaz Lake	Broad/KSA/no EVQO	

Kotsine Falls	Broad/KSA/no EVQO
MacDonald Lake	Broad/KSA/no EVQO
Macdougall Lake	Broad/KSA/no EVQO
McKnab Lake	Broad/KSA/no EVQO
Mossvale Lake	Broad/KSA/no EVQO
Motasse Lake	Broad/KSA/no EVQO
Mount Alexander	Broad/KSA/no EVQO
Mount Gordon	Broad/KSA/no EVQO
Mount Grant	Broad/KSA/no EVQO
Mount Laidlaw	Broad/KSA/no EVQO
Mount Tom	Broad/KSA/no EVQO
Murray Ridge	Broad/KSA/no EVQO
Murray Ridge High	Broad/KSA/no EVQO
Nahounli Lake	Broad/KSA/no EVQO (North side within a PPA)
Nancut Creek & Trail	Broad/KSA/no EVQO
Natazutlo Lake	Broad/KSA/no EVQO
Nation River (Upper)	Broad/KSA/no EVQO
Nautley-Sowchea Historical Trail	Broad/KSA/rec EVQO (VQC of Retention recommended for 100m on each side of the trail centerline by Trail Planning Team)
No Name Lakes	Broad/KSA/no EVQO (Eastern lake within a PPA)
North Road	Broad/KSA/no EVQO
Ocock River	Broad/KSA/no EVQO
Omineca River (inc. Mount Ogden)	Broad/KSA/no EVQO (eastern portion within a PPA)

			Electra Lake	Broad/KSA/no EVQO	
			Elliott Lake	Broad/KSA/no EVQO	
			Elmore Lake	Broad/KSA/no EVQO	
			Fable Lake	Broad/KSA/no EVQO	
			Foerster Lake	Broad/KSA/no EVQO	
			Fumar Creek	Broad/KSA/no EVQO (within a PPA)	
			Gidegingla Lake	Broad/KSA/no EVQO	
			Gordon Lake	Broad/KSA/no EVQO	
			Green Lake	Broad/KSA/no EVQO	
			Hatdudatehl Lake	Broad/KSA/no EVQO	
			Henning Lake	Broad/KSA/no EVQO	
			Highway 27	Broad/KSA/no EVQO	
			Humphrey Lake	Broad/KSA/no EVQO	
			Hunitlin Mountain	Broad/KSA/no EVQO	
			Inzana Lake	Detailed/KSA/no EVQO	
			Island Lake	Broad/KSA/no EVQO	
			Jenny Lake	Broad/KSA/no EVQO	
			Jumping Lake	Broad/KSA/no EVQO	
			Karena Lake	Broad/KSA/no EVQO	
			Kazchek Lake	Broad/KSA/no EVQO	
			Kelly Lake	Broad/KSA/no EVQO	
			Keppel Lake	Broad/KSA/no EVQO	
			Kettle Glaciers	Broad/KSA/no EVQO	
			Kloch Lake	Broad/KSA/no EVQO	
			Kluatantan Lakes	Broad/KSA/no EVQO	
			Kluatantan River	Broad/KSA/no EVQO	
			Kluayaz Lake	Broad/KSA/no EVQO	

Kotsine Falls	Broad/KSA/no EVQO
MacDonald Lake	Broad/KSA/no EVQO
Macdougall Lake	Broad/KSA/no EVQO
McKnab Lake	Broad/KSA/no EVQO
Mossvale Lake	Broad/KSA/no EVQO
Motasse Lake	Broad/KSA/no EVQO
Mount Alexander	Broad/KSA/no EVQO
Mount Gordon	Broad/KSA/no EVQO
Mount Grant	Broad/KSA/no EVQO
Mount Laidlaw	Broad/KSA/no EVQO
Mount Tom	Broad/KSA/no EVQO
Murray Ridge	Broad/KSA/no EVQO
Murray Ridge High	Broad/KSA/no EVQO
Nahounli Lake	Broad/KSA/no EVQO (North side within a PPA)
Nancut Creek & Trail	Broad/KSA/no EVQO
Natazutlo Lake	Broad/KSA/no EVQO
Nation River (Upper)	Broad/KSA/no EVQO
Nautley-Sowchea Historical Trail	Broad/KSA/rec EVQO (VQC of Retention recommended for 100m on each side of the trail centerline by Trail Planning Team)
No Name Lakes	Broad/KSA/no EVQO (Eastern lake within a PPA)
North Road	Broad/KSA/no EVQO
Ocock River	Broad/KSA/no EVQO
Omineca River (inc. Mount Ogden)	Broad/KSA/no EVQO (eastern portion within a PPA)

			Otterson Lake	Broad/KSA/no EVQO	
			Pam Lake	Broad/KSA/no EVQO	
			Pinchi Road	Broad/KSA/no EVQO	
			Prudential Mountain	Broad/KSA/no EVQO	
			Purvis Lake	Broad/KSA/no EVQO	
			Rock (Glaucers Lake)	Broad/KSA/no EVQO (within a PPA)	
			Rubyrock Lake	Broad/KSA/no EVQO	
			Salmon Lake	Detailed/KSA/no EVQO	
			Salmon River	Broad/KSA/no EVQO	
			Silver Lake	Broad/KSA/no EVQO	
			Skeena River	Broad/KSA/no EVQO	
			Slamgeesh Lake	Broad/KSA/no EVQO (within a PPA)	
			Spawning Lake	Broad/KSA/no EVQO	
			Specularite Lakes	Broad/KSA/no EVQO (within a PPA)	
			Starret Lake	Broad/KSA/no EVQO	
			Stuart River	Broad/KSA/no EVQO (mostly within a PPA)	
			Tachie Road	Broad/KSA/no EVQO	
			Takatoot Lake	Detailed/KSA/no EVQO	
			Tatsadah Lake	Broad/KSA/no EVQO	
			Teardrop Lake	Broad/KSA/no EVQO	
			Tetana Lake	Broad/KSA/no EVQO	
			Thompson Lake	Broad/KSA/no EVQO	
			Tom Lake	Broad/KSA/no EVQO	

			Tomas Lake	Broad/KSA/no EVQO	
			Tsaytut Spur	Broad/KSA/no EVQO	
			Tsilcoh Falls	Broad/KSA/no EVQO	
			Tsilcoh River	Broad/KSA/no EVQO	
			Tulle Lake	Broad/KSA/no EVQO	
			Tureen Lake	Broad/KSA/no EVQO	
			Tzahny Lake	Broad/KSA/no EVQO	
			Wudtsi Lake	Broad/KSA/no EVQO	
			Yatzutzin Lake	Broad/KSA/no EVQO	
Mackenzie Forest District Uncertainties related to unrefined and outdated visual landscape inventories (VLIs) make the LRMP recommendations of identifying, managing, and protecting the integrity of important viewscapes for commercial and non-commercial recreation, making scenic areas known, and establishing VQOs difficult. This lack of up-to-date VLI data has also the potential of unnecessarily constraining timber access and supply (TSRs) in the TSA.	LRMP (June 2000 version)	The LRMP provides specific recommendations on geographic areas or viewscapes for which visual quality management is important enough to have them made known as "scenic areas". The Table also made specific recommendations on the areas for which VQOs should be established by the DM. There are also a few areas for which the Table did not find necessary to recommend that they be formally designated as "know scenic areas" or to be managed with established VQOs. However, The Table did agree that resource development activities in these areas should consider visual quality where required. Some areas listed in the LRMP have no VLI data in place at any scale. The rest of the viewscapes identified in the LRMP are currently inventoried broadly at 1:250,000 or in detail at 1:50,000 but both levels of inventory are outdated. In addition, the broad VLI does not take into account the screening effect found in the field by vegetation and topography, which has	**Mackenzie Town site viewshed, including Morfee Lakes**	Detailed/KSA/rec. EVQO	
			Germansen Corridor	Detailed/KSA/no EVQO	
			Gataga River	Broad/rec. KSA/no EVQO	
			Johiah Lake	Broad/rec. KSA/no EVQO	
			Obo Lake	Broad/rec. KSA/rec. EVQO	
			Large unnamed lake west of Obo Lake	Broad/rec. KSA/rec. EVQO	
			Frog River	Broad/rec. KSA/no EVQO	
			Spinel Lake	Broad/rec. KSA/no EVQO	
			Finlay River	Broad/no KSA/no EVQO	
			Obo River	No VLI/no KSA/no EVQO	
			Driftpile Lake	Broad/rec. KSA/no EVQO	
			Braid (Sheep) Ck./ Kechika Rv. Confluence	Broad/rec. KSA/no EVQO	

		shown to unnecessarily inflate the size of areas mapped as visually sensitive. Detailed but outdated VLIs may also overestimate the size of visually sensitive areas or may underestimate them if new viewpoints have to be added or vegetative screens have been removed since the last inventory. Also, many of the areas recommended for VQO establishment are only inventoried broadly at 1:250,000, which is not the recommended scale for establishing VQOs due to area overestimation problem explained above. The knowledge gaps identified above not only impact timber supply and the implementation of the LRMP recommendations, but render operational planning difficult with the risk of creating adverse visual impacts and negatively affecting visual, recreation and tourism values in the short-term. To address these issues, detailed VLIs would provide the improved knowledge base necessary to implement the LRMP recommendations and increase certainty about the effects of strategic decisions on timber supply (TSR3). In addition, detailed up-to-date VLIs would better meet the Forest Certification principles.	**Citreon (Big) Creek/ Kechika Rv. confluence**	Broad/rec. KSA/no EVQO	
			Sifton Pass	No VLI/rec. KSA/no EVQO	
			Kechika River inc. Davie Trail	Broad/no KSA/no EVQO	
			Fort Ware	Detailed/KSA/rec. EVQO	
			Weissener Lake	Broad/rec. KSA/no EVQO	
			Fox Lake	Broad/rec. KSA/no EVQO	
			Area southwest of Warneford/Kwadacha Forks	Broad (Partial VLI)/ rec. KSA/no EVQO	
			Baby Lake	Broad/rec. KSA/no EVQO	
			Thutade Lake	Broad/rec. KSA/no EVQO	
			Toodoggone Lake	Broad/rec. KSA/rec. EVQO (specifically Retention)	
			Toodoggone River (to the confluence of Finlay River)	No VLI/rec. KSA/rec. EVQO (specifically Retention)	
			Pelly Lake	Broad/rec. KSA/no EVQO	
			Barrier Pass	No VLI/rec. KSA/no EVQO	
			Tsay Keh	Detailed/rec.KSA/rec. EVQO	
			Ed Bird – Estella Lakes	Detailed/KSA/rec. EVQO	
			Herchmer Pass	Broad/rec. KSA/no EVQO	
			Tobin Lake	Broad/rec. KSA/no EVQO	
			Aiken Lake	Broad/rec. KSA/no EVQO	
			Tutizzi Lake	Detailed/KSA/no EVQO	

			Osilinka Lakes (also known as Big Big and Little Big Lakes)	Broad/rec. KSA/no EVQO	
			Uslika Lake	Broad/rec. KSA/no EVQO	
			Nina Lake	Detailed/rec. KSA/no EVQO	
			Shadow Lakes	Broad/rec. KSA/no EVQO	
			Shadow Lk. Camp Area	Broad/rec. KSA/rec. EVQO	
			Discovery Creek viewshed (as seen from major viewpoints on Omineca River within the PPA)	No VLI/rec. KSA/no EVQO	
			Duckling Creek viewshed (as seen from major viewpoints on Omineca River within the PPA)	No VLI/rec. KSA/no EVQO	
			Twenty Mile Creek viewshed (as seen from major viewpoints on Omineca River within the PPA, from Gebhardt Arm, Germansen Lake PPA, and from Twenty Mile Guide Camp)	No VLI/rec. KSA/no EVQO	
			Viewshed from 10 Mile and 14 Mile	Detailed/KSA/no EVQO (Viewshed part of the Germansen Corridor, which is already a KSA as recommended by LRMP)	
			Germansen Mountain (as seen from PPA section of the Omineca River, Gebhardt Arm,	Detailed/KSA/no EVQO	

			and Germansen Lake		
			Manson Creek Community	Detailed/KSA/no EVQO	
			Baldy Trail	Broad/rec. KSA/no EVQO	
			Manson Lakes	Detailed/KSA/rec. EVQO	
			Wolverine Lakes	Detailed/KSA/no EVQ (inventoried from FSR & Recreation Site only)	
			Klawli Lake	Broad/rec. KSA/no EVQO	
			Tsaydachi Lake	Broad/rec. KSA/no EVQO	
			Wicked River Bay	Detailed/KSA/no EVQO	
			Selwyn Bay	Detailed/KSA/no EVQO	
			Clearwater Bay	Detailed/KSA/no EVQO	
			Ducette Bay	Detailed/KSA/no EVQO	
			Nabesche Bay	Detailed/KSA/no EVQO	
			Schooler Bay	Detailed/KSA/no EVQO	
			Bernard Bay	Detailed/KSA/no EVQO	
			Point (Creek) Bay	Detailed/KSA/no EVQO	
			Canty Lake	Broad/rec. KSA/no EVQO	
			Curve Lake	Broad/rec. KSA/no EVQO	
			Shoal Lake	Broad/rec. KSA/no EVQO	
			Finlay Bay	Detailed/KSA/rec. EVQO	
			Dina Lake #1	Broad/rec. KSA/rec. EVQO	
			Heather Lake	Broad/rec. KSA/rec. EVQO	
			Cut Thumb Bay	Broad/rec. KSA/rec. EVQO	
			Clearwater Lake	Broad/rec. KSA/no EVQO	
			Highway 97	Detailed/KSA/rec. EVQO	
			Highway 39	Detailed/KSA/no EVQO	
			Sabai Lake		

			Tudyah Lake **Burden Lake** **Nation River** (as seen from viewpoints on the water upstream from the bridge at 25km on the Nation FSR to the Plan Area western boundary) **Butternut Lake**	Broad/rec. KSA/no EVQO Detailed/rec. KSA/no EVQ (partial VLI from hwy only) Broad/rec. KSA/no EVQO Broad/rec. KSA/no EVQO Broad/rec. KSA/no EVQO	
Dawson Creek Forest District Uncertainties related to unrefined and outdated visual landscape inventories (VLIs) make the LRMP recommendations of identifying scenic areas, managing visual quality, developing and establishing VQOs in consultation with the public and through landscape unit level planning processes difficult. Although the last TSR did include in the final analysis the detailed VLIs data, which resulted in substantial timber supply gain compared to the broad data that were used earlier in the process, the lack of up-to-date VLIs data has also the potential of unnecessarily constraining timber access and supply (TSRs) in the TSA.	LRMP	The LRMP Table did not recommend the deletion of any specific scenic areas currently known in the Dawson Creek TSA or in the TFL but did recommend the addition of new scenic areas. The LRMP Table did not recommend that currently established VQOs be removed or new ones established for the time being. However, the LRMP Table does recognize that additional scenic areas may be identified and made known in the future and more VQOs be developed and established by the MoF in consultation with the public where concerns exist. A related strategy in the plan is that the LU Planning process identifies the scenic areas requiring the establishment of site-specific VQOs. The currently known scenic areas are either inventoried broadly at 1:250,000 or in detail at 1:50,000 but both levels of inventory are outdated. Broad VLIs do not take into account the screening effect found in the field by vegetation and topography, which has shown to unnecessarily inflate the size of areas	**Peace River Corridor** **Moberly River Corridor** **Pine River** (Chetwyn to Peace River) **Hart Highway** (inc. Bickford Lookout Trail) **Murray River Corridor** **Bulley Valley** **Sukunka River Corridor** (inc. Windfall Ck. Rec. Site) **Williston Lake Corridor**	Broad & Detailed/KSA/ EVQO Broad/KSA/no EVQO Broad & Detailed/KSA/ EVQO (for \ortions of river visible from Hwy 97) Detailed/KSA/EVQO Detailed/KSA/EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Detailed/KSA/EVQO (except for a gap with no VLI along the south shore in the TSA) Note: Detailed VLI update done in	

		mapped as visually sensitive. Detailed but outdated VLIs may also overestimate the size of visually sensitive areas or may underestimate them if new viewpoints have to be added or vegetative screens have been removed since the last inventory. The LRMP is also presenting a strategy under the General Management Direction dealing specifically with maintaining the broad VLI mapping at 1:250,000 up-to-date for incorporation into the LU and operational planning processes. This in turn requires that the detailed 1:50,000 VLI mapping be also maintained up-to-date to feed in into the broad VLI update. The knowledge gaps identified above not only impact timber supply and the implementation of the LRMP recommendations, but render operational planning difficult with the risk of creating adverse visual impacts and negatively affecting visual, recreation and tourism values in the short-term. To address these issues, detailed VLIs would provide the improved knowledge base necessary to maintain the 1:250,000 broad VLI, increase certainty about the effects of strategic decisions on timber supply (TSR3), LRMP recommendations, and SLUP implementation. In addition, detailed up-to-date VLIs would better meet some of the Forest Certification principles.		1999 in TFL 48	
			Jackfish Lake	Broad/KSA/no EVQO	
			Halfmoon Lake	Broad/KSA/no EVQO	
			Stewart Lake	Broad/KSA/no EVQO	
			Highway 29	Detailed/KSA/EVQO	
			Heritage Hwy (inc. Flatbed Ck., Stony Lake, Redwillow River & Thunder Ck. Rec. Sites)	Detailed/KSA/EVQO	
			Kiskatinaw Bridge	Broad/KSA/no EVQO	
			Salt Ridge/Murray Salt Ridge Connector Snow Trails	Broad/KSA/no EVQO	
			Wright Lake	Broad/KSA/no EVQO	
			Wapiti Crossing Recreation Site	Broad/KSA/no EVQO	
			Wapiti/Onion Lakes & Trails	Broad/KSA/no EVQO	
			Wapiti River Rec. Site	Broad/KSA/no EVQO	
			Tuck Lake	Broad/KSA/no EVQO (in a PPA)	
			Belcourt Lake	Broad/KSA/no EVQO	
			Warner Lake	Broad/KSA/no EVQO	
			Lone Prairie North	Broad/KSA/no EVQO	
			Lone Prairie South	Broad/KSA/no EVQO	
			Moose Lake	Broad/KSA/no EVQO	
			Bearhole Lake	Broad/KSA/no EVQO (in a PPA)	

			Blackhawk Lake	Broad/KSA/no EVQO	
			Foot Lake	Broad/KSA/no EVQO	
			Boulder Lake Rec. Site	Broad/KSA/no EVQO	
			Bickford Lake	Broad/KSA/no EVQO	
			Hook Lake	Broad/KSA/no EVQO	
			Anderson Lake	Broad/KSA/no EVQO	
			Twin Sisters (Beattie) Peaks (views from the peaks)	No VLI/rec. KSA/no EVQO	
			Scenic values along the traditional access corridors in the Twin Sisters RMZ	No VLI/rec. KSA/no EVQO	
			Views within Twin Sisters RMZ as seen from the Klin-se-za PPA	No VLI/rec. KSA/no EVQO	
			Boudreau Lake	Broad/KSA/no EVQO (in a PPA)	
			Lemoray Lakes	Broad/KSA/no EVQO (in a PPA)	
			Heart Lake	Detailed/KSA/EVQO (in a PPA)	
			Greg Duke Rec. Site	Broad/KSA/no EVQO	
			Bear Mountain	Broad/KSA/no EVQO	
			Community Forest		
			Snow Lake	Broad/KSA/no EVQO	
			Babcock Trail	Broad/KSA/no EVQO	
			Hambler Lakes	Broad/KSA/no EVQO	
			Dinosaur Lake	Broad/KSA/no EVQO	
				Broad/KSA/no EVQO	

			Dimsdale Lake	(in a PPA)	

9.2.4 VEGETATION RESOURCE INVENTORIES

A prerequisite for Sustainable Forest Management is an accurate description of the current state (size, composition and structure) and dynamics (rate and direction of change) of the forest, and the spatial and temporal nature of resource allocation to users. SFM objectives and resulting strategy are based on human values, most of which are related to one or combination of the following factors:

- a specific stand type
- a specific pattern of stand types
- a specific stage of stand development, or
- a specific pattern of stand development stages.

The vintage of most forest resource inventories in the Region is old (often exceeding 20 years), particularly in the Peace River and Fort Nelson management units. The accuracy and reliability of some of these inventories makes future projections of timber and non-timber values uncertain. Uncertainty in the present and future forest condition makes strategic resource planning difficult. In many cases, improving forest resource information represents the single most effective forest management strategy. Creation of new or improved information on the state of the forest and its stands, sites and waterbodies may offer potential solutions to resource supply constraints, depending on the nature of the forest and supply problems.

As outlined in Section 8, improving the state of the vegetation resource inventory throughout the region must begin with consolidation of all known resource inventory information with the dual objective of making known information available, and evaluating it's accuracy and reliability. An output of this project is a strategic plan for subsequently enhancing inadequate information. This process must be untaken in each management unit, considering not only the age of the existing inventory, but also the timeliness relative to TSR. Investment emphasis is recommended for Fort Nelson, Fort St. John and Dawson Creek in view of the more serious state of timber emphasis inventories in these districts. A similar emphasis is recommended for the Vanderhoof supply block to support the IFPA initiative there. Table 9.2.4 provides the VRI investment requirements, and recommended project timing considered appropriate fo the scale of the problem.

Table 9.2.4. VRI Inventory Strategic Investments Required in the Prince George Forest Region.

Forest District	20001/02 ($)	2002/03 ($)	2003/04 ($)	2004/05 ($)	2005/06 ($)
Prince George	150 000	100 000	100 000	0	0
Robson Valley	0	250 000	250 000	0	0
Vanderhoof	600 000	250 000	0	0	0
Fort St. James	0	0	0	0	0
Mackenzie	75 000	500 000	500 000	500 000	0
Dawson Creek	350 000	250 000	0	0	0
Fort St. John	1 000 000	750 000	750 000	500 000	500 000
Fort Nelson	1 250 000	1 000 000	500 000	500 000	0
Total Investments	**$3 425 000**	**$3 100 000**	**$2 100 000**	**$1 500 000**	**$500 000**

9.2.5 GROWTH AND YIELD INVENTORY – SITE PRODUCTIVITY

This category is a mis-classification of the issue. Site productivity is not a land base property per se. Site productivity potential is an expression of forest land capability for a given tree species - site productivity is always expressed as a stand attribute. Nevertheless, this information is a key element in the projection of stand dynamics and yield across the entire region. Without an accurate means of projecting stand, and ultimately forest growth, the supply of forest values cannot be determined, and meaningful and efficient SFM management strategies are not possible.

Section 8 describes two strategies for resolving the paucity of site productivity potential information. Initially, all local knowledge and information concerning site productivity potential for timber production must be consolidated, organised and extended. A further output of this strategy is development of a tactical plan for improving the state of knowledge. The second strategy, guided by the first, is a growth and yield research core activity, in addition to a local data collection initiative. Research is required to resolve knowledge gaps on site productivity estimation procedures, followed by the collection of local data within each management unit.

9.2.6 ECOSYSTEM INVENTORIES

Biogeoclimatic (BGC) unit mapping has existed for most of the Prince George region for about 15 years. During this time period periodic updates of certain portions of the region have been conducted as time and budget have allowed. Inadequacy of the existing mapping for current planning processes and other operational needs makes a complete update critical.

The original mapping was done by making use of field information and relationships between BGC unit breaks and elevation to draw ink lines on mylars of 1:250 000 NTS maps. This original line work was digitized along with some updates to form the latest digital BGC layer. A hardcopy of the new digital linework was photographically overlain with 1:250 000 NTS maps to form the existing 1:250 000 BGC unit hard copy maps. Due to shifts in scale etc. during the steps outlined above current hard copy maps available are inaccurate.

Current planning exercises including Landscape Unit Planning (LUP) require mapping at a finer scale (i.e., 1:20 000). Some licensees have been updating the BGC layer in conjunction with Terrestrial Ecosystem Mapping (TEM) and Predictive Ecosystem Mapping (PEM) projects. The areas completed either consist of TFL's or landscape units. This piecemeal approach to updating the linework is inefficient and means that not all areas have the same quality of information.

The estimated cost of enhancing the precision of ecosystem map products is $240 000 over a three year period. The estimated budget for 2001/02 is $120 000This work would be conducted by Craig DeLong (MoF, Region), in partnership with Marvin Eng and Del Meidinger (MoF, Research Branch). Within two years a variety of inventory/decision-support products would be produced including:

- downloadable electronic BGC coverage (ARC and IGDS formats) for Prince George Region available at a web or ftp site;
- print on demand colour maps of:
- each district at approx. 1:600 000 scale;
- the region at approx. 1:800 000 scale; and
- each 1:250 000-map-sheet in the region including contour lines and roads

9.2.7 FISH AND FISH HABITAT INVENTORIES

The inventory census is incomplete for population and habitat information concerning northern fish species and fisheries habitat. Inadequate or unreliable knowledge prevents the definition of clear and measurable objectives, thereby frustrating effective management planning. Without a means of projecting future populations and habitat supply of species such as Bull trout, Arctic Grayling, a conservation management strategy in most forest management units is impossible. The reader is directed to Section 8 for details on strategies for improving fisheries inventories. Table 9.2.7

Table 9.2.7 Fisheries Inventory Strategic Investments Required in the Prince George Forest Region.

Forest District	20001/02 ($)	2002/03 ($)	2003/04 ($)	2004/05 ($)	2005/06 ($)
Prince George	160 000	285 000	285 000	285 000	35 000
Robson Valley	160 000	285 000	285 000	285 000	35 000
Vanderhoof	160 000	285 000	285 000	285 000	35 000
Fort St. James	160 000	285 000	285 000	285 000	35 000
Mackenzie	160 000	285 000	285 000	285 000	35 000
Dawson Creek	160 000	285 000	285 000	285 000	35 000
Fort St. John	160 000	285 000	285 000	285 000	35 000
Fort Nelson	160 000	285 000	285 000	285 000	35 000
Total Investments	**$1 280 000**	**$2 280 000**	**$2 280 000**	**$2 280 000**	**$280 000**

9.2.8 WILDLIFE AND WILDLIFE HABITAT INVENTORIES

The census is incomplete for population and habitat information of wildlife species not currently considered at risk (moose, elk deer, pine marten wolverine and mountain goat). Inadequate or unreliable knowledge prevents the definition of clear and measurable objectives, thereby frustrating effective management planning. Without a means of projecting the future supply of these wildlife species, a management strategy in most forest management units is impossible.

In an approach similar to Section 9.2.5, a two three component strategy is recommended to resolve this resource information problem. Firstly, known information is assembled, organized and extended to users. Secondly, a inventory gap program is implemented to provide missing, key information elements. The third strategy is not an inventory activity, and consists of population and habita projection model development. Table 9.2.8 a) provides an estimate of the costs to implement the first two strategies.

Table 9.2.8 b) provides an estimate of the costs to implement a similar strategy directed exclusively at the Northern Caribou, a critically important species in the region.

Sustainable Forest Management places great emphasis on the preservation of biodiversity, particularly the conservation of species of plants, animals considered "at risk" from forest development. In the Prince George Forest Region the following species are generally considered within this category:

- Grizzly bear
- Wolverine
- Fisher

- Arctic Grayling
- Bull Trout
- White Sturgeon
- Various raptors and songbirds

Population and habitat status and dynamics for each of these species has not been completely evaluated, preventing clearly defined and measurable objectives for their preservation and enhancement. Until this knowledge is acquired, SFM principles demand the most cautious and conservative management strategies, which often severely constrain the supply of other forest resources in "at risk" species management zones.

A similar two-component inventory investment should be focused on consolidating, organising and extending all known information for plant and animal species known or assumed to be currently "at risk" within each management unit. An output of this project is a strategic plan for the collection of key, missing information. Table 9.2.8 c) provides an estimate of the costs of such strategy.

Table 9.2.8 a) Wildlife Inventory Strategic Investments Required in the Prince George Forest Region.

Forest District	20001/02 ($)	2002/03 ($)	2003/04 ($)	2004/05 ($)	2005/06 ($)
Prince George	70 000	110 000	110 000	100 000	100 000
Robson Valley	70 000	110 000	110 000	100 000	100 000
Vanderhoof	70 000	110 000	110 000	100 000	100 000
Fort St. James	70 000	110 000	110 000	100 000	100 000
Mackenzie	70 000	110 000	110 000	100 000	100 000
Dawson Creek	70 000	110 000	110 000	100 000	100 000
Fort St. John	70 000	110 000	110 000	100 000	100 000
Fort Nelson	70 000	110 000	110 000	100 000	100 000
Total Investments	**$560 000**	**$880 000**	**$880 000**	**$800 000**	**$800 000**

Table 9.2.8 b) Caribou Inventory Strategic Investments Required in the Prince George Forest Region.

Forest District	20001/02 ($)	2002/03 ($)	2003/04 ($)	2004/05 ($)	2005/06 ($)
Prince George	150 000	100 000	100 000	0	0
Robson Valley	0	0	0	0	0
Vanderhoof	150 000	100 000	100 000	0	0
Fort St. James	200 000	100 000	100 000	0	0
Mackenzie	150 000	100 000	100 000	0	0
Dawson Creek	150 000	100 000	100 000	0	0
Fort St. John	0	0	0	0	0
Fort Nelson	0	0	0	0	0
Total Investments	**$800 000**	**$500 000**	**$100 000**	**$0**	**$0**

Table 9.2.8 b) Species-at-risk Inventory Strategic Investments Required in the Prince George Forest Region.

Forest District	20001/02 ($)	2002/03 ($)	2003/04 ($)	2004/05 ($)	2005/06 ($)
Prince George	220 000	400 000	400 000	400 000	400 000
Robson Valley	220 000	400 000	400 000	400 000	400 000
Vanderhoof	220 000	400 000	400 000	400 000	400 000
Fort St. James	220 000	400 000	400 000	400 000	400 000
Mackenzie	220 000	400 000	400 000	400 000	400 000
Dawson Creek	220 000	400 000	400 000	400 000	400 000
Fort St. John	220 000	400 000	400 000	400 000	400 000
Fort Nelson	220 000	400 000	400 000	400 000	400 000
Total Investments	**$1 760 000**	**$3 200 000**	**$3 200 000**	**$3 200 000**	**$3 200 000**

10 RECREATION SITE AND TRAIL MAINTENANCE

10.1 INTRODUCTION

The Ministry of Forests (ministry) manages recreation resources and public use on Crown forest lands. Managing the recreation resource involves three activities:

- maintaining an inventory of recreation features and recreation settings;
- planning for recreation; and
- incorporating recreation information into referrals for operations proposed on Crown forest lands.

To enable the public to enjoy Crown forest lands for recreation, the staff of the Prince George Forest Region manage192 recreation sites and 87 recreation trails.

10.2 REGIONAL ISSUES AND PRIORITIES

10.2.1 BUDGET REDUCTIONS AND USER FEES

In 1998, no base funds were available for maintaining recreation sites and trails. The lack of site and trail maintenance resulted in an escalation of public and media complaints during the summer. In response to this situation, the ministry allocated $1.0 million provincially to keep the recreation sites open, nothing more.

In 1999, recreation fees at sites and some trails were introduced to partly recover the cost of maintaining these facilities. (See **Appendix 12.10.1** for the schedule of recreation fees). The ministry was able to provide basic maintenance at most of the recreation sites, at a cost of $2,358,000, provincially, with funding coming from three sources:

- Revenue from the recreation fees ($392,000 camping pass and $166,000 camping permit);
- $1.0 million ministry base funds; and
- approximately $800,000 of risk managed base funds from other programs.

In addition $200,000 was allocated to regions for compliance and enforcement patrols, some of which was used to patrol recreation sites.

In 2000, more than 300 recreation sites across the province were either closed or transferred to BC Parks, reducing the total number of sites managed by the ministry to 1118. The Ministry was able to provide basic maintenance at most of the recreation sites at a cost of $2,725,000 with funding coming from the following sources:

- revenue from the recreation fees ($750,000 camping pass and $175,000 camping permits);
- $1.0 million ministry funds; and
- approximately $800,000 risk managed funds from other programs.

An additional $140,000 of base funds was allocated to regions for recreation site patrols.

10.2.2 RECREATION SITE DETERIORATION

To date, revenue from recreation fees and funding from government have not been sufficient to manage the recreation sites to ministry standards. The lack of funding has prohibited the ministry from maintaining the infrastructure at recreation sites, estimated to be worth over $13 million provincially. As a result there is a backlog of structure repair and replacement dating back to 1998 when funding was first cut. As an example some sites have deteriorated to the point where essential structures such as entrance signs and toilets are no longer in place. In the Prince George Region there are 33 sites without entrance signs, and 10 have no toilet facilities.

Compounding the problem of deteriorating conditions at recreation sites is a higher public expectation of service and structures at these facilities due to the fact that fees are being charged.

10.2.3 TRAIL DETERIORATION

No funding has been dedicated to trails since 1997. The trails and the infrastructure on them are deteriorating and public safety, environmental and liability risks are escalating. The ministry will have to review the option of closing trails do to lack of funding next year.

10.2.4 RECREATIONAL RESOURCE MANAGEMENT

No resources have been available to carry out recreation resource management activities except at a very cursory level.

At the time the recreation fees were introduced it was estimated that the revenue from camping pass sales would eventually cover approximately 40 to 50% of the costs of managing the recreation sites. In 1999 revenue from camping pass sales was approximately $450,000 and is forecasted to increase to approximately $550,000 in 2000. It appears that the initial target of 40 to 50% cost recovery from camping pass sales will be very difficult to achieve. Consequently the need for more government commitment to the program is required if the existing number of recreation sites and trails are to be maintained.

10.2.5 RECREATION ACTIVITY PRIORITIES

Given the lack of funding, newly introduced user fees, higher public expectations, on-going deterioration of the infrastructure and escalating public safety, environmental and liability risks, it is critical that the RMP build the business case for public recreation opportunities managed by the ministry. In this regard, the priority ranking and funding needs for recreation activities are summarized in Table 10.1, and described subsequently.

10.2.5.1 RECREATION SITES AND TRAILS

Critical Priority

BASIC SITE MAINTENANCE

$347 180 is required to for site maintenance activities that if not carried out next year will lead to:

- significant public safety risks;
- environmental damage;
- increasing liability risks and possible court action; or
- widespread adverse publicity.

BASIC TRAIL MAINTENANCE

$116 700 is required for trail maintenance activities that if not carried out next year will lead to:

- significant public safety risks;
- environmental damage;
- increasing liability risks and possible court action; or
- widespread adverse publicity.

RECREATION FEE ADMINISTRATION

$95 000, provincially, is required for recreation fee administration to ensure that revenue is collected to partly off-set the cost of managing the campgrounds and trails.

High Priority

RECREATION SITE PATROLS

$47 900 is required for essential recreation site patrol activities that if not carried out year will lead to:

- significant public safety risks;
- vandalism and loss of structures at campgrounds;
- reduced compliance and less revenue from camping fees; or
- widespread adverse publicity.

BACKLOG STRUCTURE REPAIR AND REPLACEMENT (SITES)

$167 275 is required for essential "catch-up" repair and replacement of structures that have not occurred at the recreation sites since 1997 due to funding cutbacks. Please refer to Appendix 12, Table A-12.10.1 for a detailed summary of required structural improvements.

ANNUAL STRUCTURE REPAIR AND REPLACEMENT (SITES)

$150 524 is required for essential repair and replacement of structures that must be carried out in order to protect and maintain the ministry 's $13 million investment at the ministry's recreation sites. Note information on trail infrastructure is not available at this time.

The total program funding level necessary to meet these priorities in the Prince George Forest Region is approximatley **$829 600.** Currently, the 2000/2001 level of funding to the region for these same activities is **$252 500**, (as indicated in Table 10.1), or 30% of what is considered necessary to adequately meet minimum management objectives.

Table 10.1 Current Funding (2000/2001) for Recreation Site and Trail Maintenance Program.

Forest District	Site Maintenance ($)	Trail Maintenance ($)	Site Patrols ($)	Total Budgeted ($)
Ft. St. John	11,200	0	4,000	15,200
Ft. Nelson	1,400	0	3,000	4,400
Dawson Cr.	29,120	0	3,500	32,620
Pr. George	64,960	0	3,500	68,460
Robson Vally	6,500	5,000	2,500	14,000
Vanderhoof	68,000	7,000	7,000	82,000
Ft. St. James	15,680	0	3,500	19,180
Mackenzie	13,180	0	3,500	16,680
Total	**$210,040**	**$12,000**	**$30,500**	**$252,540**

Table 10.2 Prince George Regional Recreational Site and Trail Management for 2001/02

Activity	Critical Priority				High Priority					
	Basic Site[53] Maintenance		Basic Trail[54] Maintenance		Site Patrols[55]		Backlog Replacement of Recreation Structures[56]		Annual Replacement of recreation Structures[57]	
Forest District:	#	$	#	$	#	$	#	$	#	$
Fort St. John	4	18,000	1	20,000	12	10,000	4	550	120	7,345
Fort Nelson	2	2,400	1	900	3	3,000	0	0	41	1,750
Dawson Creek	13	33,120	14	3,000	4	4,400	15	4,800	348	20,012
Prince George	59	110,000	21	15,000	12	10,000	281	64,550	870	42,475
Robson Valley	14	21,500	21	30,000	4	3,500	12	6,900	105	15,585
Vanderhoof	34	107,000	15	27,000	12	10,000	101	56,350	546	26,742
Fort St. James	38	41,980	6	20,800	4	3,500	74	16,700	308	23,095
Mackenzie	28	13,180	8	0	4	3,500	107	17,425	358	13,520
Sub-total by Activity	192	347,180	87	116,700	55	47,900	594	167,275	2696	150,524
Total by Priority	**$463,880**				**$365,699**					
Total year 02 - 03[58]	$510,268				$218,266					
Total year 03 - 04	$561,295				$240,093					

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[53] Basic site maintenance is defined as clean out houses, tidy rake area, clean firepits, minor repairs to structures, pump toilets, collect garbage and manage hazard trees. # refers to numbers of campgrounds and day use sites.

[54] Basic trail maintenance is defined as clearing windfall, hazard trees and bush, maintaining trail tread and minor repairs to structures and markers. # refers to number of trails.

[55] # of site patrols refers to number of patrol days (2 person 8 hours shift). # covers overtime costs.

[56] Backlog Replacement of structures are for sites only, trail structures are not included at this time.

[57] Annual Replacement of structures is based on a 10-year expected life of structures and so equals 10% of the total value of the structures.

[58] High priority activites for years 2002/2005 includes site patrols and annual replacement of structures (backlog replacemernt of structures addressed in 2001-2002). Figures in year 2002 - 2005 increase 10% per year.

Total year 04 - 05	$617,424	$264,102

Moderate Priority

SITE AND TRAIL REHABILITATION

Activities required for monitoring and evaluating the condition of the ministry's recreation sites and trails, planning and carrying out rehabilitation at sites and trails. (**Note:** figures have not been provided for this activity at this time.)

Low Priority

DEVELOPMENT

Improvements that will enhance forest recreation opportunities for the public. (**Note**: figures have not been provided for this activity at this time.)

10.2.5.2 RECREATION AND VISUAL LANDSCAPE MANAGEMENT

Table 10.3 presents the recreation and visual landscape management funding requirements as viewed from the provincial perspective (prepared by Forest Practices Branch). This activity largely concerns the maintenance of recreation and visual landscape inventories throughout the region. While this summary reflects input from Prince George Forest Districts, it fails to adequately address the serious state of these inventories in the Prince George Region.

Table 10.3 Provincial Recreation and Visual Landscape Program Funding Needs.

Forest Region	# Districts Reported	PRIORITY HIGH		PRIORITY MODERATE		PRIORITY LOW	
		#	$	#	$	#	$
Cariboo	0/5						
Kamloops	2/7	1	20,000				
Nelson	5/6	5	51,500	3	3,000		
Prince George	6/8	5	59,500	4	[illegible]		
Prince Rupert	4/6	1	5,000	5	125,000		
Vancouver	5/8	3	85,000	2	[illegible]	1	5,000
Headquarters	1/1	1	50,000	1	75,000		
Total		**16**	**271,000**	**15**	[illegible]	**1**	**5,000**
Total year 02-03			298,000		285,000		
Total year 03-04			327,000		313,500		
Total year 04-05			360,000		345,000		

In Table 10.3 a high priority has been placed on completion of essential recreation and visual landscape resource analysis and planning that if not carried out will lead to:

- significant conflicts with other forest resources and recreation activities;
- loss of recreation and visual resource values; or
- widespread adverse publicity.

A moderate priority has been placed on completion of recreation and visual landscape research, operational trials and studies that if not carried out will lead to:

- continued conflicts with other forest resources and recreation activities; or
- loss of recreation and visual resource values

Operations staff in the Prince George Region agree in principle with the provincial priorities, but the funding requirements ($59 500 and $44 000, respectively) are inadequate to address the serious problems facing recreational management throughout the region.

Specific, management unit recommendations for recreational and visual resources inventory needs are discussed subsequently.

Recreational Inventories

PRINCE GEORGE FOREST DISTRICT

Strategies LRMP for developing recreation and tourism opportunities outlined in the Prince George specifically include:

- Creation of more recreation trails and sites in response to demand where compatible with other uses;
- Discouraging the impacts from recreationalists on the environment;
- Developing management plans that reduce conflicts between recreation users;
- Identifying and classifying lakes in consultation with the public for recreation;
- Considering roaded recreation in access management planning.

There is a risk that these non-timber resources are not being adequately managed to meet LRMP objectives due to outdated and poorly defined inventories. For example, uncertainties related to outdated Recreation Features Inventories (RFI), make it difficult or impossible to classify lakes, which in turn prevents the development and implementation of meaningful recreational resource plans.

The RFI for the Prince George district has not been updated since 1994. It consists of large, poorly defined polygons which do not adequately represent key features, especially near rivers and lakes.

An estimated **$30 000** is needed immediately to begin to correct these inadequacies. These funds will ensure an update of approximately 75 map quadrants @ $400/quadrant

MACKENZIE FOREST DISTRICT

The Mackenzie LRMP establishes a forest recreation goal of maintaining opportunities for a diverse range of recreational and tourism values and uses across the planning area. Implementing this goal cannot be done without a complete and comprehensive analysis of all recreational opportunities.

Outdoor recreation is important as a source of relaxation and renewal for Mackenzie area residents and visitors, as well as a source of income for the community and its tourism operators. These non-timber resources are highlighted in several RMZ's within the LRMP. They are also used as indicators of sustainable forest management in the criteria and indicators of sustainable forest management developed by the Canadian Council of Forest Ministers.

Without complete recreation inventory coverage in the District, there is an increased risk that recreation values may be overlooked or deteriorate from overuse, or that heightening use may lead to user conflicts.

All but approximately 10 mapsheet quadrants in the north east portion of the Mackenzie District have been updated. An estimated **$14 000** is required immediately to complete ROI and RFI inventories for 6 quadrants in mapsheet 094K, and 4 quadrants in mapsheet 094F, @ $700/quadrant for for each inventory.

DAWSON CREEK FOREST DISTRICT

The ROS and RFI for the Dawson Creek District were completed in 1994. It has been rolled over to RIC standards, but has not been updated since 1994. The LRMP recognizes that the viability of outdoor, nature-based wilderness tourism is expected to increase with an anticipated growth of commercial recreation opportunities.

Outdated RFI's and ROS inventories, may fail to take into account features that have been identified recently or changes to the factors that define ROS class ie. distance from road, evidence of humans, motorized use, solitude. These factors change over time based on social/industrial use of the landbase, and yet the LRMP relies on the outdated ROS to identify the complete spectrum of recreation opportunities, and to define access management.

The entire district requires an ROS update, while the RFI needs to be refined for approximately 10 quad sheets. An estimated **$20 000** is required immediately to update approximately 50 mapsheet quadrants @ $400/quadrant. An additional **$2 000** is required to refine the RFI for approximately 10 mapsheet quadrants @ $200/quadrant.

FORT ST. JOHN FOREST DISTRICT

The Recreation Features Inventory was not adequate for the needs of the Fort St. John District when originally. This inventory is not useful for the review of Operational Plans and the district is relying on the local knowledge of staff when considering recreation values. Should the staff be unavailable or move to other jobs, this knowledge would be lost and no standardized inventory data is available to be utilized.

A complete RFI re-inventory is required immediately to meet the recreational management needs of the district. An estimated **$36 000** is required to complete this inventory on approximately 90 mapsheet quadrants.

FORT NELSON FOREST DISTRICT

The ROS and RFI for the Ft. Nelson District were rolled over in 1994, utilizing data compiled at an even earlier time. Outdated RFI's and ROS inventories may fail to take into account features that have been identified recently or changes to the factors that define ROS class ie. distance from road, evidence of humans, motorized use, solitude. These factors change over time based on social/industrial use of the landbase, and yet the LRMP relies on the outdated ROS to identify the complete spectrum of recreation opportunities, and to define access management.

An estimated **$80 800** is required immediately to correct the inadequacies of the current inventory on approximately 202 mapsheet quadrants @ $400/quadrant.

Visual Resource Inventories

This resource management issue is similar in nature to that described for recreational inventories, but differs from a specific value perspective. Visual landscape inventories delineate, classify, and record the areas that are considered to be visually sensitive and that could give rise to public concern if their appearance were altered by resource development activities.

A visual landscape inventory, therefore, serves to flag those areas that warrant special attention and consideration in strategic and operational planning because of their sensitivity to visual alteration. Without accurate and reliable visual landscape inventories in all management units, it is difficult to determine societal values and objectives and have proper input into the various planning processes. For example, uncertainties related to the lack of, or to outdated visual landscape inventories make implementation of LRMP strategies difficult for the following key objectives:

- Identifying, managing, and protecting the integrity of important viewscapes for commercial and non-commercial recreation;
- Making scenic areas known; and
- Establishing visual quality objectives;

The creation of new or improved visual landscape inventory information would not only support the implementation of LRMP strategies, but would also help to locally refine the visual resource input into Timber Supply Reviews, and potentially reduce the impact on timber supply associated with current use of broadly defined visual. Improved knowledge of visually sensitive landscapes would not only improve strategic and operational planning, but also benefit a variety of stakeholders, including the general public.

Table 10.4 provides an estimate of the Visual Resources Inventory needs for each Forest District in the Region. Readers are encouraged to review the visual landscape inventory issues and priorities documented in Section 9 (Forest Resources Inventories) of this RMP for a detailed summary of inventory projects by District.

Table 10.4 Estimated Costs of a Program to Completing New/Updating Old Visual Landscape Inventories in the Prince George Forest Region

Forest District	Number of Scenic Areas requiring inventory update in the next 3 years	Cost Estimate ($)
Dawson Creek	10	124,000
Fort Nelson	3	85,000
Fort St. James	14	210,000
Fort St. John	3	80,000
Mackenzie	10	130,000
Prince George	16	250,000
Robson Valley	12	206,000
Vanderhoof	12	200,000
Grand Total	**83**	**$ 1,285,000**

11 RESEARCH

11.1 INTRODUCTION

The research component of the Prince George Forest Region is composite plan made up of four sources of information:

1. Internal Ministry of Forests, Prince George regional research needs analysis;
2. Strengthening Sustainable Forest Management strategies addressable through research tactics (see Section 8),
3. Recommended studies required to implement the Sustainable Harvest program;
4. Research needs identified in other related RMP components, including Forest Health Maintenance (Section 4), Enhancing Environomental Values (Section 5) and Recreation Site and Trail Maintenance (Section 10)
5. A research knowledge gap analysis exercise sponsored by Forest Renewal BC throughout July and August, 2000.

The linkages, overlaps and redundancies inherent in this RMP component have created much confusion for planners, researchers and stakeholders alike. The most problematic has been understanding the role of the Forest Renewal Research Knowledge Gap Analysis, and its relationship with the other elements of the Research RMP.

In May, 2000, Forest Renewal BC documented their intention to identify forest research priorities suitable for their research investment strategy. Research and extension priorities were to be identified through multiple sources (see Figure 11.1) including:

- the RMP process,
- a separate, detailed, needs analysis process specific to the FRBC Research Program (including Regional workshops and a Provincial Think tank), and
- additional sources including advisory groups, analysis of past research, and program plans.

The FRBC Research Strategy was designed to drive a directed call for proposals in September, 2000 (for strategic research) as well as provide information to the RMP approval process for operational studies within the Sustainable Harvest RMP.

In 2001/02 the processes were to be inter-linked primarily through the participation of individuals in both processes. Researchers would be involved in the RMP process, and operational staff would be involved in Regional Research workshops. In future years, the processes may be linked more formally.

This planning cycle is the first time Forest Renewal have implemented this approach to developing their research progam. It was designed as a separate section in the RMP Guidelines and was included in the Information Session handbooks distributed at the regional RMP meetings in April, 2000. The role expected of, and actually played by stakeholders, and District and Regional Ministry staff is summarised in Section 11,2

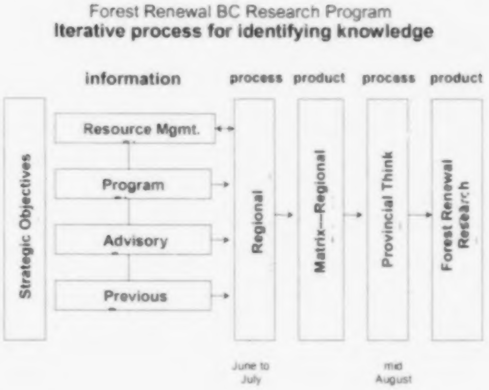

Figure 11.1 **Forest Renewal Research Knowledge Gap Process**

The Research Knowledge Gap process was implemented mainly through a series of facilitated workshops held in each Forest Region. The purpose of the workshops was to broadly identify knowledge gaps across all of FRBCs strategic goals, as well as incorporating information from the RMP process for SH, EEV and SSFM strategic goals. Local, regional and provincial operational, policy and research experts were invited to participate at these sessions.

MOF Regional Researchers were invited to participated in the process and were were assigned specific tasks by Forest Renewal. They were first asked to review the 2000/2001 RMP, then collaborate with technical specialists in each Forest District during June and early July, 2000. It was assumed that District Planning Teams would be undertaking RMP meetings at that time, and they would benefit from the information exchange and help identify knowledge gaps, ongoing research funding requirements, and the availability of existing knowledge in most research fields. They were not, however, involved in RMP discussions at districts because these planning unit meetings had not, with few exceptions, commenced by that time.

Researchers were then invited by Forest Renewal BC to take part in a Regional Research Knowledge Gap workshop, held on July 12, 2000. Their expected role was to review, and bring information gained from the RMP process to the regional Research workshops and (where timing permitted), forward it to the Southern Interior Forest Extension & Research Partnership (SIFERP), or bring it to a Provincial Strategy session (held August 15-17, 2000). Obviously, researchers were not in possession of RMP research needs and recommendations at the time of the Regional Workshop, nor were they familiar with preliminary RMP planning by the time of the Provincial meeting, since few planning tables in the Prince George Forest Region were in a position to meet this, or the August 31 deadline.

Both FRBC Knowledge Gap workshops were attended by representatives from the Prince George Region. Representation by stakeholders and District MoF staff was very poor, however–participation was through invitation by FRBC. Of 85 participants, only 8 represented forest industry firms or organization. This was also the case at the Provincial meeting, where very few representatives attended from the Prince George George Region. Representation at both sessions favoured research and development organizations, most of whom were from Victoria or the southern interior. Most acute was the lack of representation by Peace River and Fort Nelson representatives. A single northern representative attended the Regional Meeting. No northern representatives took part in the August workshop.

Despite the poor stakeholder representation, the recommendation made at the Prince George Regional Workshop were considered very good by all who attended. Described in Section 11.2.1, they are included in this RMP largely due to poor extension, to date, in the Knowledge Gap exercise, but also in an attempt to document completely the research review process under mandate by Forest Renewal on behalf of the region.

The second research strategy session in August resulted in little of value to a research problem analysis for the Prince George Region. Availability of the results of the workshop were delayed until mid October, and appear to have added nothing to the better results of the regional session. They are included in Section 11.2.2 for the information of stakeholders who may not otherwise review them in their Internet Website format. It is essential that Prince George resource managers be familiar with the strategic direction of research which is meant to support their management decisions.

Operational studies proposed through the RMP process will also become part of the Research Program priority identification process, although investment in specific projects will still be determined through the Regional Investment Planning process. Projects approved in MYA's will be subject to the standards and rigour required at the provincial level. An operational studies protocol is currently underdevelopment by the Ministry of Forests Research Branch, on behalf of Forest Renewal BC. These guidelines will be available in December, 2000. Section 11.2.3 is an assembly of all such studies recommended in prevous sections of the Regional RMP.

11.2 REGIONAL RESEARCH ISSUES AND CONCERNS

11.2.1 PRINCE GEORGE REGIONAL RESEARCH KNOWLEDGE GAP WORKSHOP RECOMMENDATIONS

The results of the Prince George Regional Knowledge Gaps Workshop, held July 12, 2000 are presented here by Forest Renewal strategic objective. Table 11.2 summarizes the overall priority rank for each of the 20 key issues, as recommended by the 85 participants of the workshop.

Strengthening Sustainable Forest Management Knowledge Gaps

At total of 73 issues were identified by a group of 17 research stakeholders in a preliminary brainstorming session. Following discussion, review and ranking, the following five key issues emerged (in order of priority):

NATURAL DISTURBANCE

Issue

What are the attributes of the past and present natural disturbance processes, and if we mimic these processes in implementation of forest practices will we achieve sustainable forest management (e.g., fire, pest, disease, landslides, floods, etc.)?

Management Practice or Policy Affecting the Issue

Most guide books, especially biodiversity.

Geographic Focus

All ecosystems in the Omineca-Peace Region.

Importance

Immediate and urgent.

MANAGEMENT OF COMPLEX STANDS

Issue

What knowledge and tools do we need to create, maintain and manage complex stands (mixed species, multi layered or many aged) for a range of resource values at stand and landscape scales?

Knowledge gaps that need to be addressed include overall stand management regimes (e.g., processes, succession, free to grow policy; harvesting, yield, stand modeling and economic and social goals and benefits)

Required tools are related to specific treatments for meeting stand management goals.

Management Practice or Policy Affecting the Issue

Mixed wood management guides, timber supply reviews, free growing guides, forest health guides, biodiversity guides, Forest Practices Code, visual quality.

Geographic Focus

BWBS - example: Even aged Aspen Spruce mixtures in clear cut / coppice system (mixed woods)

ESSF - example: Uneven aged spruce sub-alpine fir management through selection system

ICH - example: Mixed species conifer stands and hardwood - conifer mixed woods, partial cuts

SBS - example: even aged mixed species stands with variable retention of Douglas fir.

The issue applies to the stand, landscape, forest, district, region and provincial scales of management.

Importance

Immediate and urgent.

STRATEGIC PLANNING AND EXTENSION

Issue

Can we increase effectiveness of strategic planning through creating and applying tools that use existing and enhanced data and/or information?

- tools applicable to operational issues
- available to resource managers
- strategic, tactical and operational tools
- awareness of tools.

Management Practice or Policy Affecting Issue

Resolving the issue will enable strategic planning to better reflect operational realities and more credible tool for demonstrating SFM.

Geographic Focus

Ecosystems represented in Omineca / Peace Region

Importance

Within 5 years.

SPECIES HABITAT RELATIONSHIPS

Issue

Within the context of the following generalized approach:

- Acquisition of baseline status information on the species at issue
- Creation of habitat model for the species at issue
- Monitoring of the impact and effectiveness of the model derived in 2

What are the effects of current and proposed forest management practices on the following species and their habitats:

- Identified wildlife
- Regionally important wildlife
- Federally (COSGWIC) - listed wildlife
- Old forest dependant species guilds

And, what is needed to be done differently in order to maintain sustainable populations of those species and their habitats?

Management Practice or Policy affecting issue

FPC, Biodiversity guidebook, LRMP, TSR/ AAC

Provincial Research investment themes

Geographic Focus

All management units in the Prince George Forest Region.

Importance

Important and urgent.

SUSTAINABLE TIMBER HARVESTING – MODELING AND ASSUMPTIONS TESTING

Do current non-timber and timber modeling assumptions succeed in predicting sustainable (ecological, social, economic) timber harvesting?

Management Practice or Policy affecting issue

TSR assumptions

Geographic Focus

MoELP, MOF, Licensees, other forest resource stakeholders

Importance

Resolve within 5 years.

Sustainable Harvest Knowledge Gaps

Participants in this working group are listed in Table 11.1. Note the very poor proportional representation from Peace River/Fort Nelson stakeholders.

Table 11.1 Sustainable Harvest Working Group Participants.

Participant	Representing
Nicole Wilder	UNBC, Prince George
Andrea Eastham	IFS, Prince George
Richard Kabzens,	MOF, Fort St. John
Greg Van Dolah,	Fraser Lake Sawmills Ltd., Vanderhoof
Ann Tobin,	Carrier Sekani Tribal Council, Prince George
Anna Rynsburger	Slocan Forest Products Ltd., Mackenzie
Chad Renzie,	UNBC, Prince George
Han sup Han	UNBC Harvesting, Prince George
Barrie Phillips	MOF Research Branch, Victoria
Peter Forsythe	The PAS Lumber Company and Vernon Seed Orchard, Prince George
Brad Hawkes,	CFS, Victoria
Les Herring	MoF, Prince George

A total of 44 issues were identified by a group of 12 research stakeholders in a preliminary brainstorming session. Following discussion, review and ranking, the following five key issues emerged (in order of priority):

FOREST PEST MANAGEMENT

Issue

What Pest/Host interaction knowledge is required to improve stand management decision making to mitigate timber supply impact on stem rest infected Pl stands within the SBS?

Management Practice or Policy Affecting Issue

Stem Rust Guidebook

Free Growing Guideline

Stocking standards

Geographic Focus

SBS in Mackenzie, Vanderhoof and Prince George, BWBS in Dawson Creek and Fort St John.

Importance

Immediate and Urgent. The issue affects declaration of free growing and affects volume losses.

ALTERNATIVE SILVICULTURAL SYSTEMS – COMPLEX AND MIXED SPECIES STANDS

Issue

What are the implications (for Growth and yield, wildlife habitat, visual quality, economics etc.)? And constraints for application of alternative silviculture systems in complex and mixed species stands?

Management Practice or Policy Affecting Issue

Appraisal allowance

Regen surveys, FG declarations

Lack of higher level plans to give direction

Stand damage and waste management surveys

Geographic Focus

BWBS, ESSF, ICH, SBS Prince George Region

Importance

Immediate Urgent. The issue must be addressed immediately, with a commitment to monitor and improve initial stategies.

BROADLEAF/CONIFER MIXED STAND MANAGEMENT

Issue

What are the appropriate proportions of broadleaf and conifer species at different stages of stand development to meet different land management (TSR and Biodiversity) objectives? This issue drives the ultimate development of minimum stocking standards for a significant portion of the timber harvest landbase in the region.

Management Practice or Policy Affecting Issue

Forest Act
Silviculture Prescriptions/FDP
Free Growing Guidelines

Geographic Focus

Moist, high productive sites with natural conifer mix (i.e. spruce understory in the SBS and BWBS in the northern districts.

Importance

Immediate and urgent. This issue affects free growing standards.

FOREST PEST MANAGEMENT – NATURAL DISTURBANCE BENCHMARKS

Issue

What are the natural disturbance regimes in the Prince George Region for fire, insect's disease and windthrow? How can we determine the appropriateness of incorporating Natural Disturbance regimes into management practices and planning?

This issue impacts wildlife habitat, old growth biodiversity requirements, growth and yield predictions (older stands), timber supply and AAC's.

Management Practice or Policy Affecting Issue

Biodiversity Guidebook

Operational Planning regulations

Riparian Management Guidebooks

Geographic Focus

All management units in the Prince George Region?

Importance

Immediate and Urgent. Need is now urgent, but lead time is required to get information and models.

SILVICULTURAL INVESTMENT ANALYSIS

Issue

How can we test silviculture assumptions used in operational silviculture investments?
Monitor actual versus predicted outcomes
forest establishment and incremental silviculture

One aspect of this problem is an information management concern?

Management Practice or Policy Affecting Issue

Stocking standards

Operational planning Regs

SP's and SMP's

Geographic Focus

All management units in the Prince George Region

Importance

Immediate and urgent. This is a monitoring exercise and we need to start it now to results over time.

Enhancing Environmental Values Knowledge Gaps

A total of 24 issues were identified by a group of 7 research stakeholders in a preliminary brainstorming session. Following discussion, review and ranking, the following five key issues emerged (in order of priority):

DATA, INFORMATION AND KNOWLEDGE EXCHANGE

Issue

How can we effectively manage data, information and knowledge resources and how can we ensure the dissemination of this data, information and knowledge to practitioners?

Physical management issues include: collection, collation, storage, dissemination, registration, indexing and cataloging.

Cultural management issues include: institutional barriers, such as jurisdiction problems among ministries (i.e. MOF & MELP); demographic barriers (including age of researchers and practitioners); attitudes: about ownership of knowledge, and attitudes about how knowledge is collected – by whom, with whom (i.e. FN knowledge), sharing knowledge across industry, NGO's, FN, communities.

Management Practices and Policies Affecting Issue

Information Systems Branch, Forest Practices Branch, MoELP, MoF, Canadian Forestry Servic, Parks Canada, Atmospheric Environment Service.

Geographic Focus

All management units in the Prince George Forest Region.

Importance

Immediate and urgent

WATER QUALITY – FRASER BASIN

What is the effect of effluent from municipal and industrial sources on the health of the Upper Fraser Basin, and downstream to coastal areas? And how can it best be mitigated/eliminated? Subordinate issue include:

- Drinking water, locally and downstream
- Fish and aquatic habitat
- Recreational use
- International pressure (Georgia Basin International Joint Committee).

Management Practice of Policy Affecting Issue

Municipal practice

Industrial practice

MoELP

Federal Department of Fisheries

Community and Provincial Health Departments

Geographic Focus

The entire Fraser River Basin, source to estuary.

Importance

Immediate and urgent.

FOREST MANAGEMENT PRACTICES – WATERSHED VALUES

What forestry practices are required in the Upper Fraser Basin to ensure environmental stewardship at a stand and landscape level? e.g. high elevation in ESSF, AT, SBS, etc. (snow accumulation, melt, landslide, regeneration, harvesting practices, knowledge, policies and values). Subordinate issues include:

- Biological (fish/forestry interations
- Social/cultural impacts

- Alternative silviculture systems
- Local level criteria and indicators
- Certification

Management Practices and Policies Affecting Issue

Traditional road engineering

FPC, DFO, MELP policies

Harvesting

Incremental silviculture

C & E

Geographic Focus

All ecosystems, all management units in the Prince George Forest Region.

Importance

Immediate and urgent.

FOREST MANAGEMENT – IMPACTS ON SPECIFIC HABITAT

What are the impacts on wildlife and aquatic habitat of continued development and management in the region, especially:

- Caribou Mountains and Sukunka Valley.
- Grizzlies in the Grizzlies in the Kakwa.
- Effects of harvesting on caribou, attracting moose and wolves → decline in caribou populations.
- Effects on anadramous and residential fish habitats.

Management Practices and Policies Affecting Issue

FPC, TSR & AAC.

Geographic Focus

Specific habitats in the ESSF, BWBS, SBS and ICH biogeoclimatic zones.

Importance

Immediate and urgent

RIPARIAN MANAGEMENT PRACTICES

Issue

How can we best manage riparian and wetland ecosystems in the Peace/Omineca region? Subordinate issues include:

- Large woody debris
- Salmon habitat
- Fine sediments

- Shade
- Water temperature, quality and quantity

Wetland and riparian areas are under-represented in research, protection and policy making. There is an immediate need for greater understanding of extent of, contribution to and importance of wetlands as carbon sources/sinks.

Management Practices and Policies Affecting Issue

Riparian guidelines

FPC

Engineering and harvesting.

Geographic Focus

All management units in the Prince George Forest Region.

Importance

Immediate and Urgent.

Sustainable Forest Management Criteria and Indicator Knowledge Gaps

Participants in this working group are listed in Table 11.1. Note the absense of representation from Peace River/Fort Nelson stakeholders, and the proportionately high representation from non-Prince George Region stakeholders.

Table 11.2 Criteria and Indicators Working Group Participants.

Participant	Representing
Keith McClain	Interim GM, McGregor Model Forest, Prince George
Alan Wiensczyk	SIFERP, Williams Lake
Stuart Taylor	Director, NFREP/MoF, Prince George
Trina Innes	SIFERP, Kamloops
Christy Buttq	Donohue Forest Products Ltd., Mackenzie
Kara Bayly	BugBusters Pest Control, Prince George
Rene Alfaro	Canadian Forestry Service, Victoria

A total of 19 issues were identified by the working group of 7 research stakeholders in a preliiminary brainstorming session. Following discussion, review and ranking, the following five key issues emerged (no priority rank is implied):

INFORMATION EXCHANGE

Issue

How can we capture, organize, maintain, and exchange current and consistent C&I information to support effective management decision-making?

Management Practice or Policy Affecting Issue

Government cost-recovery policies

Proprietary limitations to access

Inconsistent information management practices and directories.

Geographic Focus

All management units in the Prince George Forest Region.

Importance

Immediate and urgent. Start design within one year.

UNDERSTANDING THE USE OF AND TIME CONSIDERATIONS OF CRITERIA AND INDICATORS

Issue

Do all stakeholders have a clear understanding of the practical use (identification, selection, forecasting, interpretation) of indicators and their interrelationships over time to evaluate progress towards SFM?

Management Practice or Policy Affecting Issue

Achievement of operational objectives.

Geographic Focus

All management units in the Prince George Forest Region.

Importance

Immediate and urgent.

PUBLIC INVOLVEMENT

Issue

How do we involve the public in technical processes related to identifying, selecting, monitoring, and reporting out of indicators of SFM?

Management Practice or Policy Affecting Issue

Management plan development

FPC

Geographic Focus

All management units in the Prince George Forest Region.

Importance

Urgent.

SUSTAINABLE FOREST MANAGEMENT CRITERIA AND INDICATORS IN THE OMINECA-PEACE REGION

Issue

Should C&I in the Omineca-Peace be improved, further developed, or tested, including the following topics:

Free-growing coniferous and free-growing northern boreal mixed-wood stands and how these indicators change by management objectives;

Biodiversity;

Watershed criteria affecting certification (compliments of EEV breakout);

Forest productivity for mixed species/aged stands and stands with forest health problems.

C&I for the above should be consistent with regional and provincial standards.

Management Practice or Policy Affecting Issue

Biodiversity guidebook

Establishment to free-growing guidebook

Setting of AAC

Identifying wildlife guidebook

Geographic Focus

All management units, except mixed-wood management pertaining to Peace Districts.

Importance

Within 5 years (free growing and biodiversity); and greater than 5 years (forest productivity).

UNDERSTAND NATURAL DISTURBANCE ISSUES

Issue

Forest disturbance areas, such as landslides, are an integral part of ecosystem processes, affecting many aspects of forest sustainability. There is a need to establish the indicators of natural disturbance recurrence, intensity, and extents, as well as their interactions. This baseline information is a necessary tool in strategic planning.

Management Practice or Policy Affecting Issue

Harvest planning, biodiversity guidelines, AAC determination, forest health strategies

Geographic Focus

All management units in the Prince George Forest Region.

Importance

Within 5 years.

Table 11.2 Overall Ranking Researchable Knowledge Gap Issues Recommended by Regional Workshop Participants.

Knowledge Gap Issue	Component	Priority Rank
Natural Disturbance & Understand Natural Disturbance Issues & Forest Pest Management – Natural Disturbance Benchmarks	SSFM C&I SH	1
Species Habitat Relationships	SSFM	2
Management of Complex Stands & Broadleaf/Conifer Mixed Stand Management & Alternative Silvicultural Systems – Complex and Mixed Species Stands	SSFM SH SH	3
Forest Pest Management	SH	4
Data, Information and Knowledge Exchange & Information Exchange	EEV C&I	5
Sustainable Timber Harvesting – Modeling and Assumptions Testing	SSFM	6
Strategic Planning and Extension	SSFM	7
Forest Management Practices – Watershed Values	EEV	8
Riparian Management Practices	EEV	9
Silvicultural Investment Analysis	SH	10
Sustainable Forest Management Criteria and Indicators in the Omineca-Peace Region	C&I	11
Understanding the Use of and Time Considerations of Criteria and Indicators	C&I	12
Forest Management – Impacts on specific Habitat	EEV	13
Public Involvement	C&I	14
Water Quality – Fraser Basin	EEV	15

11.2.2 PROVINCIAL RESEARCH KNOWLEDGE GAP WORKSHOP RECOMMENDATIONS

11.2.2.1 STRENGTHENING SUSTAINABLE FOREST MANAGEMENT ISSUES

First Nations

ISSUE 1: HOW DO WE GATHER AND UTILIZE INDIGENOUS KNOWLEDGE?

Goal 1

Indigenous Knowledge is incorporated into forest management.

Strategies

- Adopt measures that satisfactorily address aboriginal interest issues until indigenous knowledge is fully incorporated into forest management.
- Determine methods to protect the intellectual property rights to indigenous knowledge while and after it is gathered.
- Research the indigenous knowledge database and determine how it can be incorporated into resource management.

Biodiversity

ISSUE 1 HOW CAN WE ACHIEVE A BETTER UNDERSTANDING OF ALL DIMENSIONS AND SCALES OF NATURAL DISTURBANCE AGENTS (FIRE, DISEASE, INSECTS, AND CLIMATE) WHICH INFLUENCE SUSTAINABLE FOREST MANAGEMENT?

Goal 1

To understand the dynamics of natural and human disturbance agents temporally and spatially across the landscape;

To develop the ability to emulate the structure and dynamics of natural disturbance in forest management practices; and,

To determine how much of the range of variability of natural disturbances can be emulated by forest management practices.

Strategies

- Benchmarking – retrospective exploration of the historical patterns of natural and human disturbance.
- Synthesis of existing information.
- Monitoring – of current disturbances (type, scale, impact).

ISSUE 2 HOW CAN WE ACQUIRE AND APPLY DETAILED KNOWLEDGE OF ABOVE AND BELOW GROUND ECOSYSTEM STRUCTURE (INCLUDING CWD, CANOPY AND UNDERSTORY DEVELOPMENT, WILDLIFE TREES), FUNCTION AND PROCESS (SUCCESSIONAL PATTERNS, COMPETITION, SNAG AND CWD DECAY RATES, TROPHIC INTERACTIONS) TO SUSTAINABLE FOREST MANAGEMENT?

Goal 2

Incorporation of knowledge of ecosystem structure and function to enhance SFM planning and practice.

Strategies

- Inventories of species, populations and communities, and their distribution.
- Quantification of population and community dynamics.
- Quantification and distribution and dynamics of ecosystem condition (horizontal, vertical structure).
- Characterisation of trophic interactions.
- Retrospective studies of species, populations and communities.

ISSUE 3 HOW CAN WE INCREASE OUR KNOWLEDGE OF SPECIES STATUS, INVENTORY, HABITAT REQUIREMENTS AND POPULATION PROCESS AND DEMOGRAPHICS TO CONSERVE ALL SPECIES SENSITIVE TO FOREST AND RANGE PRACTICES?

How will current, future and cumulative forest practices and other human impacts affect individuals and populations of sensitive species, including coarse filter species at all spatial and temporal scales?

Goal 3

Conserve species sensitive to forest and range practices through increased knowledge and improved management.

Strategies

- Synthesis of existing information.
- Inventory and status of individual sensitive species and habitats.
- Assessment of sensitive species habitat requirements across all scales.
- Determination of the impact of forest practices on habitat requirements.
- Experimentation and hypothesis testing of appropriate species management treatments.
- Development of risk assessment methodologies of both individuals and populations.
- Implementation of operational trials and associated adaptive management.
- Development of habitat supply models and incorporation into decision-making processes.

Economic

ISSUE 1 HOW DO WE DEVELOP AND IMPROVE FOREST ESTATE MODELS (FEM) TO ANSWER QUESTIONS ON WOOD FLOW, NON-TIMBER VALUES, HABITAT SUPPLY, ECONOMICS, AS OPERATIONAL DECISION MAKING TOOLS TO ACHIEVE SFM?

Goal 1

To develop/improve forest estate planning models that will allow resource managers, scientists and researchers to appropriately apply tools to sustainable forest management planning issues.

Strategies

- Upgrade the timber and non-timber data sets used in FEM as required (will vary according to management unit). These sets may be map products or they may be revised netdown figures derived from adaptive management or corporate data base analysis.
- Improve our knowledge of the habitat requirements and relationships of key wildlife species.
- Improve our knowledge of patch size configuration and deployment in FEMs.

- Cooperatively settle current differences of opinion between agencies, as to the FPC, Land Use Planning and higher level plan rule sets, and the tradeoffs needed between some rule sets.
- Benchmark current spatial models against the FSSIM model used in TSR.
- Develop functionality in FSSIM and spatial models with regard to partial cutting and natural disturbance, particularly in the inoperable land base.
- Develop common FEM output reports to assess tradeoffs between forest and non-forest values. Common economic output reports are suggested.
- Utilize FEM's in the testing of forest certification assumptions and standards that will ultimately provide for SFM.
- Utilize FEM's in tracking and monitoring global carbon cycling in at multiple spatial and temporal scales.

ISSUE 2 HOW DO WE MAINTAIN ECONOMIC VIABILITY WITHOUT COMPROMISING ENVIRONMENTAL STANDARDS?

Goal 2

To develop strategies and methods that can maintain and/or enhance economic viability without compromising environmental standards.

Strategies

- Use FEM and related analyses to detect cases of overlapping objectives, e.g. cases where certain FPC guidelines are in fact met by other guidelines.
- Initiate an expert review of the business processes and procedures and identify areas of inefficiency with low risk to SFM.
- Determine if current initiatives such as log trading models may improve the profitability of groups of licensees in particular management units.

ISSUE 3 WILL SFM ACHIEVE CERTIFICATION, AND TO WHAT DEGREE WILL IT INFLUENCE MARKET ACCESS?

Goal 3

To achieve SFM and gain increased market access through forest certification.

Strategies

- Develop models to determine how current FPC management practices are affecting certain C&I and compare these findings with the differing management regimes proposed under certification systems.
- Investigate the relationship between sustainable forest management at stand and landscape level and forest certification (which is primarily a stand level process).
- Provide the background data necessary to implement regional certification.
- Conduct benchmark productivity, soil conservation, genetic diversity and related studies on commonplace harvesting and silvicultural practices, to determine their sustainability.
- Develop a tracking and monitoring system which will give forest industry licensees, communities, government and forest products consumers the ability to monitor the performance of SFM.

- Monitor market share and confirm effectiveness of certification efforts.

ISSUE 4 IS THE EXISTING TENURE AND STUMPAGE SYSTEM AN IMPEDIMENT TO THE COMPETITIVENESS OF THE FOREST INDUSTRY AND THE ACHIEVEMENT OF SFM?

Goal 4

To identify tenure or stumpage reforms that will increase the competitiveness of the industry and improve on SFM.

Stategies

- Promote a high level, provincial review and cost/benefit analysis of both existing systems and possible alternatives, with the objective of maximizing the benefits to the province, reducing the administrative complexities of the existing systems and achieving higher standards of forest management.
- Facilitate pilot projects that test and document innovative ideas related to stumpage and tenure.

Water

ISSUE 1 WHICH FOREST PRACTICES (INCLUDING FORESTRY AND CROWN RANGE ACTIVITIES) WILL ALLOW US TO MANAGE THE FOLLOWING WATER RESOURCES (BOTH SURFACE AND GROUNDWATER) ON A SUSTAINABLE BASIS?

Goal 1

Within five years adopt "best forest and range management practices" that allow us to manage our water resources on a sustainable basis including:

- Water quality (including temperature, nutrients, and waterborne disease)
- Water Quantity (including peak and low flows)
- Associated Risks (including catastrophic events)
- Physical Characteristics (including channel morphology)
- Aquatic Habitats.

Strategies

- Understand the "natural state" for each water attribute.
- Understand how current and historic practices affect water resources and attributes.
- Determine the best practices.

ISSUE 2 WHICH WATER-BASED INFORMATION AND INFORMATION COLLECTION STRATEGIES, AND TOOLS DO WE NEED TO ADEQUATELY MANAGE THE FOREST RESOURCE? DO WE HAVE SUFFICIENT WATER-BASED INFORMATION TO SUPPORT FOREST CERTIFICATION?

Goal 2

To develop and implement water-based information, information collection strategies and tools needed to adequately manage the forest and range resources and support forest certification.

Strategies

- Determine information gaps.
- Conduct research to determine appropriate level of information collection.
- Develop tools and methods to apply information to areas where no information is available.

Soil

ISSUE 1 THE ROLE OF SOIL ORGANISMS IS CRITICAL TO THE MAINTENANCE OF BIOLOGICAL PRODUCTIVITY AND ABOVE AND BELOW GROUND BIOLOGICAL DIVERSITY, HEALTHY ECOSYSTEM FUNCTION AND THE PROVISION OF FOREST AND RANGE GOODS AND SERVICES. WE DO NOT UNDERSTAND THE IMPACTS OF MANAGEMENT ON SOIL ORGANISMS OR ON THE INTERACTIONS BETWEEN SOIL ORGANISMS.

Goal 1

To understand the role of soil organisms in forest ecosystem functioning and identify the effects of forest management practices on them.

Strategies

- Evaluation and synthesis of existing knowledge of:
- Contributions of soil organisms to biodiversity and functioning of forest ecosystems.
- Effects of forest management practices on soil organisms.
- Mushrooms as a product of healthy soil ecosystems.
- Identify opportunities and initiate soil ecological investigations that build on existing field installations where other aspects of ecological functioning and or silvicultural treatment response are being studied.
- Production of taxonomic atlases for key forest soil organisms which incorporate knowledge of ecological roles and distribution.

ISSUE 2 HOW CAN WE INCREASE THE PRODUCTIVE CAPABILITY OF FOREST AND RANGE SOILS IN AN ECOLOGICALLY SUSTAINABLE FASHION?

Goal 2

Forest managers will have criteria and tools for identifying sites where productivity can be enhanced, and for choosing the most beneficial treatments.

Strategies

- Review, synthesize and disseminate existing knowledge of treatment responses (by tree species and ecosystem type) to provide guidance to managers and identify high priority gaps.
- Secure, maintain and re-measure existing installations to ensure that maximum benefit is derived from this investment.
- Expand or add installations to address identified tree species, ecosystems and treatment gaps.

- Conduct complementary monitoring to verify that treatment responses observed experimentally are realized operationally – use these observations to suggest new hypotheses for research and to refine decision-making tools.

ISSUE 3 SOIL DISTURBANCE FROM FOREST MANAGEMENT PRACTICES CAN REDUCE LONG-TERM PRODUCTIVITY AND ADVERSELY AFFECT OTHER RESOURCES. THIS IS REFLECTED IN A NUMBER OF FPC PROVISIONS AND IN NETDOWN ASSUMPTIONS USED IN TSR.

Goal 3

Research will ensure that soil information is available with which to refine Forest Practices Code guidelines, TSR assumptions and improve site level soil management practices.

Strategies

- Define and evaluate the existing information base.
- Examine existing research installations for relevance to this problem.
- Support existing installations that represent a significant historical investment and have a high potential for producing solutions.
- Articulate gaps that could be addressed and rank them in order of priority.

Social

ISSUE 1 HOW DO WE MORE EFFECTIVELY INCORPORATE SOCIAL AND ECONOMIC CONCERNS IN SUSTAINABLE FOREST MANAGEMENT, ADAPTIVE MANAGEMENT AND DECISION MAKING PROCESSES?

Goal 1

To have research and access to knowledge so that Social and Economic values are utilized in sustainable forest management, adaptive management and decision making processes.

Strategies

- Identify and measure social and economic values.
- Integrate social and economic values with bio-physical information.
- Integrate social and economic values with decision-making processes.
- Evaluate the extent and benefits of social value analysis in resource planning processes.
- Consider social and economic values from local, regional, provincial and global scales.

ISSUE 2 HOW CAN COMMUNITY-BASED FOREST MANAGEMENT CONTRIBUTE TO SUSTAINABLE FOREST MANAGEMENT?

Goal 2

To incorporate community values in local SFM through comprehensive community involvement.

Strategies

- Define activities and processes that contribute to community-based forest management.
- Evaluate community forest pilots.
- Evaluate other community-based forest management initiatives (partnerships).
- Disseminate research results to communities.

ISSUE 3 HOW DO WE IMPROVE PUBLIC PARTICIPATION PROCESSES IN BRITISH COLUMBIA?

Goal 3

To have public participation processes that include a full representation of public interests and proactive input into the processes.

Strategies

- Evaluate the effectiveness of PPP's.
- Explore alternative frameworks and to evaluate their effectiveness.
- Develop models for effective public participation.

Terrain Geomorphology

ISSUE 1 WHAT MANAGEMENT PRACTICES CAN BE USED TO REDUCE THE LIKELIHOOD OF INDUCED LANDSLIDES?

Goal 1

Sites that are susceptible to landslides are identified and management practices tailored to site conditions.

Strategies

- Better identification of terrain susceptible to post harvest landslides.
- Develop better, cost-effective road building techniques in marginally unstable terrain.

ISSUE 2 HOW CAN WE IMPROVE OUR ABILITY TO PREDICT TERRAIN THAT IS SUSCEPTIBLE TO LANDSLIDES, AND IDENTIFY THE RISK ASSOCIATED WITH LANDSLIDES?

Goal 2

Improved terrain stability maps will be completed for high priority areas reflecting more reliable information about Terrain stability including a risk analysis.

Strategies

- Development of landslide risk methods appropriate to mapping.
- Additional terrain attributes studies done.

Climate Change

ISSUE 1 FOREST AND RANGE ECOSYSTEMS AND THEIR HUMAN USES ARE PROFOUNDLY AFFECTED BY CLIMATE CHANGE. IN TURN, FOREST AND RANGE MANAGEMENT PRACTICES ARE AN IMPORTANT HUMAN INFLUENCE ON THE GLOBAL CARBON CYCLE. HOW DO WE MEASURE AND ALLOW FOR THE IMPLICATIONS OF GLOBAL CLIMATE CHANGE IN SFM MODELS?

Goal 1

Understand the potential impacts of climate change on forest and range resources and implications for management (e.g., the effects on biodiversity, First Nations traditional cultural use, water, socioeconomic, soil, etc.); and,

Understand the impacts of management on carbon cycling.

Strategies

- Performance measures -- need to consider limitations of scientists in being able to ensure that research is incorporated into management and operations.
- May be repetition of goals and strategies across groups -- need to ensure integration into one overall goal to avoid repetition in call for proposals.

11.2.2.2 SUSTAINABLE HARVEST ISSUES

Site/Stand Productivity

ISSUE 1 HOW CAN WE PRODUCE BETTER INFORMATION ABOUT THE GROWTH AND YIELD OF FOREST STANDS?

Strategies

- Estimating site productivity.
- Predicting response to silviculture treatments, including First Nations silv regimes.
- Predicting forest health imacts on growth and yield.
- Predicting natural stand development patterns for comparisons with management.

ISSUE 2 HOW CAN WE CREATE BETTER INVENTORIES OF TIMBER AND NON-TIMBER RESOURCES SUCH AS THE VEGETATIVE RESOURCES INVENTORY (VRI) METHODS, SUPPLEMENTED BY OTHER FORMS OF MAPPING AND SAMPLING?

Strategies

- Increasing the harvesting landbase through better identification of problem types.
- Increasing access to timber by improving multi-resource management decisions.

Stand Management

ISSUE 1 HOW CAN WE BETTER PREDICT THE EFFECTS OF SILVICULTURE ON CROP VALUE (QUANTITY/QUALITY), INCLUDING DENSITY, JUVENILE WOOD, GROWTH RINGS AND OTHER ATTRIBUTES, OF SPECIES WHERE QUALITY HAS A SIGNIFICANT IMPACT ON VALUE?

Strategies

- Consulting with others working on same problems (ie tree improvement programs) with consideration to quality attributes.
- Identifing silvicultural treatments that affect quality.
- Analyzing opportunities for additional quality research and fund projects.

ISSUE 2 HOW CAN WE PREDICT THE IMPACT OF VARIOUS TREATMENTS AND ACTIVITIES ON STRUCTURE OF STANDS, AND SUITABILITY AND CAPABILITY OF HABITAT ?

Strategies

- Maintaining existing trials.
- Evaluating the knowledge available by developing and importance matrix that includes a wide range of data.
- Establishing appropriate trials in identified areas designed to provide data consistent with model development and validation.
- Provide support for model development.

ISSUE 3 HOW CAN WE INCORPORATE LAND CURRENTLY OUTSIDE THE PRODUCTIVE OR OPERABLE LAND BASE INTO THE PRODUCTIVE LAND BASE AND IMPROVE PRODUCTIVITY OF LOW/POOR SITE LAND THROUGH SILVICULTURAL TREATMENTS?

Strategies

- Maintaining or expanding existing long-term studies addressing this problem.
- Identifying strategic areas and opportunities for additional studies.
- Establishing appropriate trials to address activities likely to have high potential response. (within 2 years).

Silvicultural Systems

ISSUE 1 HOW CAN WE UNDERTAKE AND SUPPORT RESEARCH (NEW AND ON GOING) AND TECHNOLOGY APPLICATIONS THAT WILL PROVIDE INFORMATION TO CONFIRM WHERE SILVICULTURAL SYSTEMS ARE OPERATIONALLY, ECONOMICALLY AND ECOLOGICALLY SOUND AND WHERE THEY CAN BE USED TO MEET TIMBER OR IRM OBJECTIVES?

Strategies

- Developing effective monitoring of systems.
- Testing existing monitoring systems.
- Establishing new trials and maintain existing trials.

- Developing predictive tools.
- Implementing partial cutting applications.

Forest Genetics and Tree Improvement

ISSUE 1 ENHANCE AND VERIFY GAINS IN SECOND GROWTH STAND PRODUCTIVITY AND VALUE THROUGH AN INCREASED UNDERSTANDING OF THE GENETICS OF GROWTH TRAITS, PEST RESISTANCE AND WOOD QUALITY?

Strategies

- Reviewing status of enhancement and verification to identify priorities and needs.
- Establishing studies to further understand silvicultural system by genetic interactions and link progeny test information with stand level productivity.

Forest Land Management

ISSUE 1 HOW CAN WE PROVIDE SUPPORTING INFORMATION AND RESEARCH FOR THE DEVELOPMENT AND VERIFICATION OF SPATIALLY BASED DETAILED FOREST MANAGEMENT PLANNING MODELS FOR BC?

Strategies

- Identifying and evaluating existing models.
- Identifying and evaluating research needs within existing models.
- Testing and comparing timber assumptions.

ISSUE 2 HOW CAN WE DETERMINE THE IMPACTS OF THE VARIOUS NON-TIMBER CONSTRAINTS AS OUTLINED IN THE FOREST PRACTICES CODE AND GUIDEBOOKS ON ACHIEVING FOREST MANAGEMENT OBJECTIVES?

Strategies

- Establishing the source of guiding scientific principles.
- Monitoring and evaluating existing implemented practices.
- Investigating alternatives to existing constraints.
- Determining methods for implementing change.

ISSUE 3 HOW CAN WE DEVELOP MODELS TO ACCOUNT FOR OTHER RESOURCE VALUES (INDIVIDUAL OR COMBINED) FOR INPUT INTO TIMBER SUPPLY ANALYSIS?

Strategies

- Examining existing models to determine in which areas models are needed.
- Developing modeling techniques.
- Testing models in situations with broad application.
- Determining methods of use and implementation.

ISSUE 4 HOW CAN WE DETERMINE IF SUSTAINABLE HARVEST AND ECOSYSTEM BASED MANAGEMENT APPROACH ARE COMPATIBLE

SSFM RESEARCHABLE ISSUES?

Strategies

- Establishing what is meant by sustainable harvest and ecosystem-based management with respect to each other.
- Comparing the results of managing under the principles of sustainable harvest (timber supply emphasis) with the results of ecosystem based management (non-timber emphasis).

Forest Health

ISSUE 1 DEVELOP AN ACCESSIBLE DATABASE THAT WILL BE CREATED TO PROVIDE INFORMATION BASED ON VARIOUS INPUTS AND WILL PROVIDE OUTPUTS ON RISK, TESTED MANAGEMENT OPTIONS AND WILL INTERFACE WITH A PEST DIAGNOSTICS SYSTEM?

Strategy

- Conducting research to compile TEK that can be used to expand our comprehension of forest health problems and guide management strategies.

ISSUE 2 HOW CAN WE PROVIDE A CONTINUAL FLOW OF NEW KNOWLEDGE AND PROVEN INNOVATIVE TECHNOLOGIES TO EXPAND THE MANAGEMENT OPTIONS FOR IMPORTANT FOREST PESTS?

Strategy

- Funding original and innovative research proposals that have a high probability of leading to new forest health management options applicable to the province-wide database.

ISSUE 3 HOW CAN WE DEVELOP A LONG-TERM MONITORING PROGRAM TO ASSIST IN THE PREDICTION OF THE IMPACT OF CLIMATE CHANGE ON THE HEALTH OF FOREST STANDS AND TO USE THESE PREDICTIONS AS A BASIS FOR THE SELECTION OF PLANTING STOCK AND THE APPLICATION OF SILVICULTURE TREATMENTS?

Strategies

- Conducting site-specific research on selected plantations in representative Biogeoclimatic zones.
- Maintaining and/or developing linkages between FRBC funded research and the Canadian Forest Service climate change network and the Forest Productivity and Forest Genetics Councils.

11.2.2.3 ENHANCING ENVIRONMENTAL VALUES

Soil

ISSUE 1 WHERE SOIL IMPACTS THROUGH FOREST OPERATIONS HAVE REDUCED SOIL PRODUCTIVITY, REHABILITATION TREATMENTS CAN BE USED TO RESTORE SOIL STRUCTURE AND FUNCTION. A LACK OF KNOWLEDGE OF THE EFFECTIVENESS OF REHABILITATION STRATEGIES HAS LIMITED OUR

ABILITY TO MAKE APPROPRIATE PRESCRIPTIONS. WHAT REHABILITATION METHODS RESTORE STRUCTURE, BIOLOGY, AND PRODUCTIVITY OF THE SOIL?

Strategies

- Establish cooperative consultative process between BC MoF, BC MoELP, researchers, licensees and other interested stakeholders.
- Complete series of installations province-wide comparing rehabilitation treatment alternatives, including cost of operations and effectiveness in achieving rehabilitation objectives.
- Continue maintenance of previously established research installations.
- Synthesize results of soil rehabilitation research and extend prescription recommendations to practitioners.

Water

ISSUE 1 IN ORDER TO EVALUATE THE EFFECTIVENESS OF FOREST PRACTICES AND THE WRP, WE NEED A BETTER UNDERSTANDING OF NATURAL AND MANAGED WATERSHED PROCESSES AND MEASURABLE AND RELIABLE INDICATORS OF WATERSHED HEALTH. WATERSHED PROCESSES INCLUDE UPSLOPE, RIPARIAN AND AQUATIC PROCESSES. WHAT ARE THE DOMINANT WATERSHED PROCESSES AFFECTING STREAM CHANNELS AND WATER IN THE VARIOUS HYDROLOGIC ZONES?

Strategies

- Determine the sediment and LOD budgets in watersheds of different sizes and hydrologic zones.
- Establish reference watersheds for longterm monitoring in various hydrologic zones.
- Conduct paired watershed studies.
- Conduct synoptic studies.
- Conduct historical analysis.

ISSUE 2 WHAT ARE THE MEASURABLE INDICATORS OF WATERSHED HEALTH?

Strategies

- Conduct synoptic studies.
- Create longterm reference sites.
- Use paired experimental approach.

4. Upstream and downstream comparisons

ISSUE 3 WHAT IS THE EFFICACY OF RESTORATION TREATMENTS AT THE SITE AND WATERSHED SCALE?

Strategies

- Treatment efficacy monitoring at site scale.
- Conduct paired watershed studies.

- Investigate sediment budgets.
- Conduct longterm studies.
- Modeling.
- Cost/benefit studies.

ISSUE 4 IS THE FPC EFFECTIVE IN MAINTAINING WATERSHED PROCESS AND PROTECTING AQUATIC VALUES?

Strategies

- Conduct synoptic studies
- Conduct paired watershed studies
- Site scale and/or watershed scale
- Holistic and/or code components eg.
- Green-up, RMZ, etc...

ISSUE 5 WHAT ARE THE FUNCTIONS OF SMALL HEADWATER STREAMS IN THE CONTEXT OF THE ENTIRE WATERSHED AND HOW DO CURRENT HARVESTING PRACTICES AFFECT THESE STREAMS?

Strategies

- Conduct synoptic studies.
- Conduct paired watershed studies.
- Modeling.
- Water-material balance studies.

Biodiversity

ISSUE 1 HOW DO WE INCREASE AND INCORPORATE OUR KNOWLEDGE OF NATURAL AND MANAGED DISTURBANCE REGIMES IN ECOSYSTEM MANAGEMENT AND RESTORATION.

Strategies

- Establish provincial working groups for coordination of info on different NDTs.
- Synthesize current data.
- Identify research priorities within NDTs.
- Develop provincial strategies for research coordination.
- Implement research within priority NDTs (ie. NDT1 and NDT4) encompassing all disturbance agents.
- Incorporation and monitoring of research results into spatial models and higher level plans.

ISSUE 2 HOW DO WE INTEGRATE MANAGEMENT OF FOREST HEALTH WITH OUR UNDERSTANDING OF MANAGED AND NATURAL DISTURBANCE REGIMES?

Strategies

- Develop methodologies to predict stochastic adverse forest health events and incorporate into susceptibility and risk rating systems appropriate for resource management plans.
- Develop strategic forest health management planning.
- Develop forest treatments appropriate to sensitive, non-harvestable, and/or protected forest areas.

ISSUE 3 HOW DO DIFFERENCES BETWEEN MANAGED AND NATURAL DISTURBANCE REGIMES AFFECT BIODIVERSITY AND HIGHER-LEVEL PLAN SPECIES?

Strategies

- Establish provincial working groups for coordination of info on different NDTs and Ecoregions
- Synthesize current data and info
- Implement research priorities within NDT's for wildlife spp.
- Develop provincial/ local strategies for research coordination
- Implement research within priority NDTs/ecoregions
- Incorporate and monitor research results into stand and landscape models

ISSUE 4 WHAT ARE THE BASELINE LEVELS, ECOLOGICALLY-APPROPRIATE TARGETS, AND ECOLOGICAL FUNCTIONS OF CWD, OLD-GROWTH, AND LEAVE-TREE RETENTION (IE. WTP) IN DIFFERENT NDTS?

Strategies

- To review existing information.
- To establish inventories of baseline in managed and unmanaged stands.
- Retrospective studies of vegetation and stand structural development after a variety of disturbances.
- Test assumptions with respect to ecological functions (eg. Wildlife habitat, soil biology).

Stewardship

ISSUE 1 THERE ISN'T MEANINGFUL PARTICIPATION OF ALL PEOPLE AND ORGANIZATIONS AFFECTED BY AN ISSUE IN PLANING AND DECISION MAKING

Strategies

- Support capacity building among all participants including government, NGO's individuals. (Capacity building means address knowledge skills, attitudes, relationships, processes, and systems.)

- Explore existing examples of initiatives that involve inclusion, meaningful participation, shared power in planning and decision-making from diverse sectors: practitioners, social science types, forestry types.
- Explore emerging thinking and practice from a variety of sources—theory and practices including academic work, community work, and cutting edge practices (eg. Municipalities, other ministries and other sectors.
- Identify indicators of meaningful participation.
- Build partnerships among FRBC and other organizations to learn about and develop approaches for capacity building (could build learning links at local, regional, provincial, federal and international levels).

ISSUE 2 LACK OF CAPACITY TO INCORPORATE A DIVERSITY OF WORLDVIEWS (VALUES, BELIEFS AND IDEOLOGIES) AND KNOWLEDGE SYSTEMS INTO FOREST POLICY, PLANNING AND MANAGEMENT.

Strategies

- To explore existing examples of incorporating diverse worldviews and knowledge systems outside of the forestry sector - e.g. California, developing countries and identify successful approaches that could be tested in BC.
- When examining parallel worldviews, what are the points of entry (e.g. values, concepts, tools, language) that will embrace diversity, respect and honour differences and find common ground for working together.
- Develop skills, knowledge and capacity building processes that communicates these concepts across all forest policy, planning and management practices.
- Establish models and pilots of inclusive worldview and knowledge system processes to test different approaches.

ISSUE 3 CURRENT ANALYTICAL AND DECISION-MAKING MODELS USED IN PLANNING AND MANAGEMENT ARE NOT ROBUST FOR ASSESSING TIMBER AND NON-TIMBER RESOURCE ALLOCATIONS AND DISTRIBUTION OF CULTURAL, ENVIRONMENTAL, SOCIAL, ECONOMIC BENEFITS AT PROVINCIAL AND LOCAL SCALES.

Strategies

- Analyze case studies where current models have been used in planning and decision-making: assess strengths and weaknesses and look for possible improvements based new methods. (BC and elsewhere).
- Develop better measures for values of non-timber resources, particularly non-economic (qualitative and quantitative) criteria.
- From a community (more than local government) perspective analyze how the full array of resources can be used to generate sustainable economic and employment benefits.
- Test and compare different models with respect to present economic and other values from the provincial to local level.

ISSUE 4 THERE IS A LACK OF KNOWLEDGE ABOUT THE SUSTAINABLE PRODUCTION AND UTILISATION OF NON-TIMBER RESOURCES (MUSHROOMS, RECREATION, SPIRITUAL.....).

Strategies

- Identify gaps in existing inventories and design standards to gather new information.
- Undertake further studies of non-timber resource ecology in order to predict responses to management treatments including choice of silvicultural systems and future productivity an second growth forests.
- Investigate traditional knowledge of non-timber resources to develop insights into management, use and education.
- Enhance resource supply models to provide multiple outputs for timber and non-timber products.
- Develop methods to determine the values of non-timber resources and enhance their values.

ISSUE 5 HOW DO WE ACHIEVE ENVIRONMENTAL STEWARDSHIP WHEN THERE IS A DIVERSITY OF OWNERSHIP AND RIGHTS –PUBLIC AND PRIVATE?

Strategies

- Undertake case studies in portions of the province where there is currently a picture of ownership and tenures. eg. Vancouver Island.
- Identify environmental stewardship issues and strengths and weaknesses of current practices.
- Compare to other places (eg. other countries, jurisdictions) to determine if solutions are transferable to BC.
- Hold a conference on issues and solutions to successful management under mixed ownerships

ISSUE 6 WE LACK THE CAPACITY TO INTEGRATE ABORIGINAL RIGHTS AND TITLE AND ISSUES WHICH INCLUDE INDIGENOUS KNOWLEDGE, DECISION-MAKING, ECONOMIC BENEFITS AND RESOURCE SHARING INTO FOREST POLICY MANAGEMENT AND PRACTICE.

Strategies

- To pilot First Nations approaches (eg. Knowledge, decision-making and management practices and use of products) on the ground at the landscape and stand level.
- To involve First Nations, industry, government, and research organizations (eg. SIFERP) in pilots.
- SIFERP type network organization for Aboriginal people.

11.2.2.4 CRITERIA AND INDICATORS ISSUES

Biodiversity

ISSUE 1 HOW CAN WE DETERMINE MEASUREMENTS, AND FEATURES THAT ARE INDICATORS OF BIODIVERSITY AT DIFFERENT SPATIAL AND TEMPORAL SCALES.

Strategies

- Review and synthesize the existing knowledge and identify potential indicators.
- Develop a process to test the potential indicators.
- Create a list of effective indicators and the appropriate scale to which they apply.
- Examine the effectiveness of current guidelines and strategies for the protection of biodiversity.

Water

ISSUE 1 HOW DO WE DEVELOP SPATIALLY AND TEMPORALLY EXPLICIT INDICATORS OF WATER AND WATERSHED CONDITIONS AND THRESHOLDS FOR MANAGEMENT? CURRENT TOOLS DO NOT PROVIDE INDICATORS OF THE NATURAL VARIABILITY AND THRESHOLDS FOR EARLY ACTION TO PROTECT WATER AND WATERSHEDS.

Strategies

- Model the spatial and temporal variation in water and watershed condition, and develop indicators and thresholds.
- Maintain established watershed experiments, and establish new long-term sites to test indicators.
- Determine appropriate range of indicator values for watersheds and early change detection.
- Conduct research to fill key knowledge gaps of indicators identified in the model(s).

Soil

ISSUE 1 WITHIN AN ECOLOGICAL FRAMEWORK, HOW CAN WE IDENTIFY SITE-SPECIFIC INDICATORS AND THRESHOLDS FOR SOIL CONSERVATION?

Strategies

- Maintain existing, and establish additional long-term soil productivity studies to test indicators.
- Define an ecological framework to aid refinement of the soil disturbance hazard risk rating system.
- Define indicators and thresholds for productivity and hydrologic effects related to compaction, CWD, etc.
- Define indicators and thresholds to test for adequate restoration of degraded soils.

Socio-Economic

ISSUE 1 HOW CAN WE IDENTIFY THE BEST PROCESS FOR DETERMINING "SCALE-APPROPRIATE" SOCIO-ECONOMIC SUSTAINABILITY INDICATORS?

Strategies

- Identify, examine, and test existing processes for determining socio-economic sustainability indicators for various space and time scales.
- Select or adapt a process to use at various scales, and recommend best processes based on their cost-effectiveness and other criteria.

First Nations

ISSUE 1 HOW CAN WE DEVELOP A PROCESS THAT ENSURES TRADITIONAL ECOLOGICAL KNOWLEDGE AND WISDOM (TEKW) IS ASSEMBLED AND EFFECTIVELY INCORPORATED INTO INDICATORS OF SFM?

Strategies

- Strategy — Develop indicators that examine whether the following process is successful in incorporating TEKW in SFM.
- Identify and collate TEKW indicators.
- Hold cross-cultural workshops to share information.
- Create partnerships and data-sharing agreements between licensees, MOF, and tribal councils.
- Use indicators of SFM that incorporate TEKW.

ISSUE 2 HOW CAN WE DEVELOP INDICATORS THAT ENSURE A FAIR BALANCE OF ECONOMIC OPPORTUNITIES ARE MET, WHILE RESPECTING SOCIAL VALUES OF LOCAL COMMUNITIES, INCREASING OPPORTUNITIES FOR ALL, AND PROVIDING INDEPENDENCE FOR ABORIGINAL PEOPLES?

Strategies

- Develop indicators that show whether the following process is successful in obtaining the balance envisioned
- Conduct economic development opportunity studies at local level.
- Develop collaborative plans to implement economic opportunities while respecting traditional and other social values.
- Affirm traditional values.
- Build capacity of Aboriginal communities by increasing education opportunities.
- Identify innovative financial mechanisms to support Aboriginal economic development.

ISSUE 3 HOW CAN WE DEVELOP INDICATORS OF LEGISLATIVE AND POLICY CHANGE THAT MEASURES PROGRESS MADE IN SHARED MANAGEMENT AT THE LOCAL LEVEL BY ABORIGINAL PEOPLES AND THE FOREST INDUSTRY?

Strategies

- Develop indicators that show whether the following process is successful in achieving the above goal.
- Identify and document innovative, shared management approaches throughout the province.
- Conduct research to determine components of success.
- Structure common components into suggestions for legislative change.
- Make legislative changes and implement policy.
- Build knowledge of opportunities available through extension work in local communities.

Ecosystem Condition and Productivity

ISSUE 1 HOW CAN WE IDENTIFY SENSITIVE - E.G., EARLY WARNING - INDICATORS OF ECOSYSTEM STRESS, AND TACTICAL APPROACHES FOR IDENTIFYING INDICATORS OF ECOSYSTEM RESILIENCE AT DIFFERENT SPATIAL AND TEMPORAL SCALES?

Strategies

- Ensure existing information (research, inventory, database, certification requirements, TEKW) is compiled and analyzed.
- Identify early warning indicator levels as normal or abnormal.
- Complete a tactical plan for identifying ecosystem resilience indicators.
- Relate indicators to ecological mapping at appropriate scales.
- Develop a program to examine the appropriateness of the indicators.

Global Cycles

ISSUE 1 HOW CAN WE DEVELOP TACTICS TO IDENTIFY INDICATORS OF CARBON SEQUESTRATION?

Strategies

- No strategy was developed due to insufficient information in database and available expertise.
- Comment: BC needs to coordinate its R&D strategies with national and international initiatives. It also needs to communicate these to the natural resources community.

11.3 POTENTIAL REGIONAL RESEARCH INVESTMENTS

PLANTING WHITE SPRUCE UNDER MATURE ASPEN

Study Cost 2001/02

$10 000

Total Cost

$70 000 over 5 years.

This project will run for a minimum of 20 years, with intensive remeasurement in years 2, 7, 12, and 17. Total cost approx. $250,000.

Funding required for next 3 years

$35 000

Partners Involved

Craig DeLong, Richard Kabzems (MoF – PG Region), Chris Hawkins (UNBC).

Description

This is an existing trial that examines planting of white spruce under mid-aged (40-70 yr old) aspen stands and compares them to white spruce planted in clearcuts. It is unique in British Columbia and is the longest standing active research trial on planting spruce under mature aspen in the boreal forest. Some previous installations installed in Alberta and Manitoba have not been kept up and also used outdated nursery techniques for the growing stock. The results from this trial will provide useful information for planning and conducting operational trials and innovative practices in the mixedwood forests across the boreal and sub-boreal forest regions of Canada. Much attention is being placed on developing innovative management regimes for the mixedwood forests in British Columbia due to the desire to regenerate stands similar to what were found naturally and due to the high costs associated with establishing white spruce plantations in these forest types. This project will provide information on a viable and low cost alternate to establish mixedwood stands that would follow a common natural successional pathway.

Deliverables

At the end of 3 years the 10 year results will be produced in a extension publication aimed at general forestry/silviculture audience. Data from trial will be incorporated into growth and yield models for mixed stands. Field tour will be conducted.

-

DISTRIBUTION AND MECHANICS OF CATASTROPHIC, LONG RUN-OUT ROCK AVALANCHES IN THE NORTHERN ROCKY MOUNTAINS

Study Cost 2001/02

$50 000

Total Cost

$50 000 over 1 year.

Partners Involved

Marten Geertsema (MoF - PG Region); John Clague (Simon Fraser University and Geological Survey of Canada); Oldrich Hungr (University of British Columbia); and Ministry of Forests (Fort Nelson Forest District).

Description

Large (tens of millions of cubic meters) rock avalanches with long run out zones occur in the Foothills of the Northern Rocky Mountains (e.g. Steamboat area, west of Fort Nelson). These landslides cause a tremendous amount of forest site loss, and pose hazards for roads and recreation trails. Forest activities could aggravate slide incidence. Little is known about the pre-conditions of these catastrophic landslides, or the prediction of run out distances.

Radar imagery, air photos, and ground observations will be used to predict magnitude / frequency relationships of these catastrophic rock avalanches and to map their distribution.

Deliverables

- Establishment report and progress reports.
- Terrain hazard maps.
- Extension publication aimed at general forestry audience.
- Preparation and submission of journal article; conference presentation(s).

DISTRIBUTION AND MECHANICS OF CATASTROPHIC, TRANSLATIONAL LANDSLIDES IN THE FORT NELSON AREA

Study Cost 2001/02

$50 000

Total Cost

$50 000 over 1 year.

Partners Involved

Marten Geertsema (MoF - PG Region); John Clague (Simon Fraser University and Geological Survey of Canada); Doug Steed (Simon Fraser University); and Ministry of Forests (Fort Nelson Forest District).

Description

Large (hundreds of millions of cubic meters) translational bedrock and soil slides occur in areas of soft, flat-lying sedimentary bedrock in the Fort Nelson area. Such slides cause a tremendous amount of forest site loss directly, and indirectly by impounding rivers and drowning upstream forests. Little is known about the recurrence intervals of these landslides. Many of these landslides occur in forested areas, including areas with large wildfires. If the recurrence intervals of these failures is greater than 100 years, there is little use in investing silviculture dollars on sites affected by these landslides.

Air photo analysis, ground observations, dendrochronology and radiocarbon dating will be used to predict magnitude / frequency relationships of these catastrophic slides and to map their distribution.

Deliverables

- Establishment report and progress reports.
- Terrain hazard maps.
- Extension publication aimed at general forestry audience.
- Preparation and submission of journal article; conference presentation(s).

FIRE AND LANDSLIDE RECURRENCE INTERVALS IN THE BOREAL FORESTS OF NORTHEASTERN BRITISH COLUMBIA

Study Cost 2001/02

$50 000

Funding required for next 3 years

$150 000

Total Cost

$50 000 over 3 years.

Partners Involved

Marten Geertsema (MoF - PG Region); Tim Jull (Arizona State University; Richard Hebda (Royal BC Museum, and Ministry of Forests (Fort St. John Forest District).

Description

Little is known about natural disturbance frequencies in the boreal forest. Well-preserved charcoal layers exist on fans and in landslide colluvium (e.g. one site along the Peace River has more than 30 charcoal layers in one profile). Such records would provide forest managers with valuable information about frequent past disturbances, allowing them to mimic forest harvesting with natural disturbances.

Tree ring observations and radiocarbon dating will be used to determine natural disturbance frequencies.

Deliverables

- Establishment report and progress reports.
- Extension publication aimed at general forestry audience.
- Preparation and submission of journal article; conference presentation(s).

HAZARDS POSED BY SUBAQUEOUS SLIDES IN LAKES IN MOUNTAINOUS AREAS

Study Cost 2001/02

$50 000

Funding required for next 3 years

$150 000

Total Cost

$150 000 over 3 years.

Partners Involved

Marten Geertsema (MoF - PG Region); John Clague (Simon Fraser University and Geological Survey of Canada); Oldrich Hungr (University of British Columbia); Ministry of Environment; and Ministry of Forests (Fort Nelson, Fort St. John, and Mackenzie Forest Districts).

Description

Recently a large underwater slide (a fan-delta collapse) in a deep lake in a mountainous area near Houston, B.C., generated a large series of destructive waves. These waves (several meters high) caused extensive damage to docks on the opposite end of the lake, and resulted in site loss on the fan. Such events pose problems for forest recreationalists in two ways. 1. Fans are gravely and tend to make favourable good camp sites. Shorelines on some of these fans are prone to sudden collapse. 2. Waves generated by collapse of these fans are extremely destructive and can oscillate on such a lake for hours.

Air photo analysis, and ground observations will be used to determine which lakes are subject to these catastrophic subaqueous slides.

Deliverables

- Establishment report and progress reports.
- Hazard maps.
- Extension publication aimed at general forestry audience.
- Preparation and submission of journal article; conference presentation(s).

FIRE-RELATED SLOPE INSTABILITY AND SEDIMENTATION: HISTORICAL FREQUENCIES ON THE WESTERN SLOPES OF THE ROCKY MOUNTAINS

Study Cost 2001/02

$50 000

Total Cost

$150 000 over 3 years.

Funding required for next 3 years

$150 000

Partners Involved

Paul Sanborn & Marten Geertsema (MoF – PG Region), Tim Jull (University of Arizona)

Description

A pilot study in the ICHwk3 (Robson Valley Forest District) suggest that fire-triggered episodes of instability and sedimentation comprise the major pulses of activity in forested watersheds on the moist to wet windward slopes of the Rocky Mountains. In particular, many of these watersheds are deeply mantled by glaciolacustrine materials, which present special challenges for soil and sediment management during forestry operations. These materials also provide conditions for both generating and preserving a record of fire-related sedimentation events, which can be radiocarbon dated, allowing the historical frequency of severe, watershed-modifying events to be reconstructed. Such chronologies would complement current methods for reconstructing natural disturbance regimes, and allow the scale of modern forest management impacts (*e.g.* prescribed fire, soil disturbance, sedimentation) to be placed in a more realistic long-term perspective.

Radiocarbon dating of charcoal and related materials will be used to estimate the frequency of fire-triggered slope instability and sedimentation in a latitudinal transect of major valleys sharing these ecological and geomorphic characteristics: moist to wet climates, infrequent but severe fires, and very erodible/unstable glaciolacustrine sediments. Field studies would focus on one major watershed east of the Rocky Mountain Trench in each of Robson Valley, Prince George, and Mackenzie Forest Districts.

Deliverables

Progress reports, journal articles, and extension bulletins/Web site pages aimed at operational forestry audiences, and conference presentations.

BOREAL MIXEDWOOD DECISION SUPPORT SYSTEM

Study Cost 2001/02

$45,000

Total Cost

$ 45,000 over 1 year

Partners Involved

Richard Kabzems (MoF – PG Region), Craig DeLong (MoF – PG Region), Chris Hawkins (UNBC), Karel Klinka (UBC) and Pal Varga (UBC)

Description

Silvicultural options for boreal mixedwoods are quite varied. The complexity and changing structure of mixedwood stands over time can create difficulties in linking the current state of the forest stand to desired outcomes. There is a large body of relevant research and operational experience that can be used to assist in forest management decisions at the stand level, to achieve stand and forest level objectives. A visual presentation combined with extension of available research would be highly effective in presenting ecological and silvicultural concepts to forest managers, First Nations, and other stakeholders.

The support system, which would be CD-ROM and/or web based would be organized according to ecological units and make extensive use of photographic examples of both initial pre-harvest conditions and successional stages under both managed and natural conditions. This project would incorporate the experience of Karel Klinka and Pal Varga of UBC in creating a very successful CD-ROM system (SELECT) for coastal B.C. forests. Once the support system has been created, the electronic design would allow rapid updates with current information. In co-operation with the Northern Forest Research and Extension partnership this format would facilitate creation of different extension products, which could be uniquely designed for specific audiences.

Deliverables

Decision Support System in CD-ROM and electronic formats aimed at general forestry audiences.

Electronic platform for creation of extension targets to specific audiences (First Nations, schools, forest resource stakeholders).

STRUCTURE AND DEVELOPMENT OF MATURE ASPEN – SPRUCE MIXEDWOODS

Study Cost 2001/02

$55,000

Total Cost

$ 330 000 over 5 years

Funding required for next 3 years

2001-02 $55,000 2002-03 $125,000 2003-04 $100,000

Partners Involved

Richard Kabzems (MoF – PG Region), and Dr. Oscar Garcia (UNBC)

Description

Complex mature stands of aspen and white spruce are a common feature of the boreal forests in northeastern B.C. Current volume and yield projections from existing models do not adequately represent complex stand dynamics. Information is required to calibrate models and improve our management practices for mixed stands. The growth patterns of trees are best understood if studied over a long period of time. However, in a short period of time, patterns of growth and development can be analyzed from stem sections taken by destructive sampling.

The study approach would be to identify candidate stands in the Dawson Creek and Fort St. John Forest Districts, stem map plots within stands, and subsequently destructively sample trees within the plots. The study results will calibrate growth and yield projections for this type of mixed species stand. In addition to improved modeling of growth and yield, the study will contribute data sets for: 1) improved silviculture strategies for mixedwoods, 2) improved estimates of site index for mixed species stands, and 3) quantification of decay levels in both aspen and white spruce in these stand types.

Deliverables

Extension publication after initial analysis of year 3 data.

Graduate student thesis.

Preparation and submission of journal article; conference presentation(s).

Reference data sets for calibration of Growth and Yield models for complex stands.

REHABILITATION OF ROADSIDE PROCESSING AREAS IN BOREAL MIXEDWOODS

Study Cost 2001/02

$75 000

Total Cost

$220 000 over 5 years

Funding required for next 3 years

2001-02 $75,000 2002-03 $70,000 2003-04 $30,000

Partners Involved

Richard Kabzems (MoF – PG Region) and Chuck Bulmer (MoF-Research Branch)

Description

Poor stocking and productivity of both broadleaf and coniferous trees is commonly observed on roadside processing areas that have a summer harvesting history in the BWBS. There needs to be an examination of potential rehabilitation techniques to ameliorate limiting soil conditions, successfully establish, and increase stocking of both broadleaf and coniferous crop trees. The existing Long Term Productivity Study in the Dawson Creek Forest District provides an established benchmark for comparing changes in soil properties and growth responses of aspen and white spruce.

Candidate sites for rehabilitation treatments would be located in the Dawson Creek, Fort St. John and Fort Nelson Forest Districts. Soil conditions pre and post treatment would be quantified and monitored. Several operationally feasible treatments would be tested (eg. Mounding and mixing attachments on excavators), and planted with container stock of commercial broadleaf and conifer species. Permanent sample plots would be established and monitored to track changes in soil properties and seedling growth performance.

Deliverables

At the completion of initial analyses; establishment report and summary progress report.

Extension publication aimed at general forestry/silviculture audience.

Preparation and submission of journal article; conference presentation(s).

PREDICTING REGENERATION AND GROWTH RESPONSES FOR ASPEN AND WHITE SPRUCE AFTER APPLICATION OF ALTERNATIVE SILVICULTURE SYSTEMS IN BOREAL MIXEDWOODS

Study Cost 2001/02

$65 000

Total Cost

$130 000 over 5 years

Funding required for next 3 years

2001-02 $65,000 2002-03 $30 000 2003-04 $35 000

Partners Involved

Richard Kabzems (MoF – PG Region), Dr. Chris Hawkins (UNBC) and Dr. Oscar Garcia (UNBC)

Description

In the Fort Nelson Forest District a number of alternative silviculture systems have been applied in boreal mixedwood stands. Where white spruce advance regeneration has been retained, analysis is required to quantify growth response and mortality of the white spruce component. Windthrow is the major cause of initial mortality for retained white spruce. Data from established wind towers will be monitored and analyzed to improve prediction of catastrophic wind events. Regeneration, growth and mortality of the broadleaf component are all hypothesized to be a function of the number, size and distribution of the retained white spruce. This relationship can be tested with analysis and modeling of the light environments created post-harvest.

Establishment of permanent sample plots will create a long-term data source for improvement of growth and yield predictions of future stand composition, yield and structure.

Deliverables

Extension publication aimed at general forestry/silviculture audience.

Graduate student thesis

Preparation and submission of journal article, conference presentations.

STRATEGIES FOR CREATING AND TENDING MIXTURES OF CONIFERS AND BROADLEAF SPECIES

Study Cost 2001/02

$65 000

Total Cost

$130 000 over 5 years

Funding required for next 3 years

2001-02 $65,000 2002-03 $30 000 2003-04 $35 000

Partners Involved

Richard Kabzems (MoF – PG Region), Dr. Chris Hawkins (UNBC), and Lorne Bedford (MoF-Victoria)

Description

The tending of young mixedwood stands is a key knowledge requirement for the BWBS. A diversity of existing research installations, especially in northeastern B.C. has created mixtures of conifer and broadleaf species through various combinations of interplanting, underplanting, and natural regeneration. Several of these sites are now approaching the 10 to 15 year mark, and will provide important opportunities to observe the dynamics of conifers and broadleaf species in deliberately-created mixtures. New installations will be required to address the implications of spatial distribution (i.e. clumps of species). Silvicultural feasibility of establishing these clumpy distributions and the growth and yield implications of such stands must be examined.

Deliverables

At the completion of initial analyses for 'clumpy' distribution experiment; establishment report and summary progress report.

Extension publication on 'clumpy' distribution for mixedwoods, aimed at general forestry/silviculture audience

Extension publication focused on implications for future stand development when assessing boreal mixed species stands at the 'Free-Growing' window

EFFECTIVENESS OF S4 RIPARIAN POLICY FOR THE MANAGEMENT OF STREAM TEMPERATURE AND FISH HABITAT

Study Cost 2001/02

$65 000

Total Cost

$195 000 over 3 years

Funding re uired for next 3 years

$195 000

Partners Involved

David Maloney, (MoF-PG Region), Heather Cullen (MoF-PG District), Patrick Teti (MoF-Craiboo Forest Region), Erland MacIsaac, Nick Leone (DFO), Adam Wei (MoELP-Peace Region), Ellen Pettigrew (UNBC), Pierre Beaudry (P. Beaudry and Associates), Peter Tschaplinski (MoF-Branch).

Description

In 1999 the Prince George District developed a policy to manage the riparian areas of small (S4) fish bearing streams. The policy was developed as the FPC Riparian Management Guidelines allowed for S4 to be logged to the streambank if the riparian area was at risk to blowdown. However, the district manager felt a policy was needed to manage S4 riparian areas for stream temperature, long term and short term large woody debris, soil disturbance and fines. The district manager's policy is now in place and workshops have been held with licensee's, consultant, and MoF regional and (PG and other) district staff to demonstrate the policy and allow for feedback. The next step is to evaluate the effectiveness of the policy and provide for modifications if required.

The effectiveness of the policy will be assessed for proposed cutblocks using a "before and after" methodology. The current S4 policy also mirrors the intermediate utililization (I.U.) treatment from 30 years ago. Consequently, a retrospective assessment will be performed to monitor shade and fish habitat parameters along S4's to assess the sffect of the I.U. treatment to provide insights regarding the effects of the current policy.

Deliverables

At the end of three (3) years results will be disseminated through extension notes, workshops and field tours to interested forestry audiences.

HYDROLOGY, STREAM MORPHOLOGY, SEDIMENT AND WATER TEMPERATURE IN THE STUART-TAKLA WATERSHEDS.

Study Cost 2001/02

$50 000

Total Cost

$150 000

Funding re uired for next 3 years

$150 000

Partners Involved

David Maloney, (MoF-PG Region), Erland MacIsaac (DFO), Ellen Pettigrew (UNBC), Pierre Beaudry (P. Beaudry and Associates), Peter Tschaplinski (MoF Branch), Dan Moore (UBC).

Description

The Stuart-Takla project was developed in 1990 to study the relationships between forest activity and the productivity of aquatic ecosystems in BC's interior. The project was developed as current research focussed on coastal watersheds and wasn't applicable to interior sites. The research is critical for making ecologically sound decisions, developing resource management guidelines, certification and influencing legislation such as BC's Forest Practices Code.

Analysis of runoff records, precipitation, water temperature and suspended sediment data will be used to identify the impacts of harvesting on the aquatic ecosystem. Recommendations regarding impacts and future direction will be a product of data analysis.

Deliverables

At the end of three (3) years recommendations will be produced and forwarded to licensee's and foresters. Project results will be disseminated through extension notes, workshops and field tours to interested forestry audiences.

11.4 SUSTAINABLE HARVEST STUDIES

Table 11.3 Studies Recommended for Support of the SH Program

Rank	Project Name	Forest District	Cost 2001/02
1	Operational fertilization Monitoring/Fertilizer Nutrition Study	Prince George	$60 000
2	Forest Health Overview Assessments –	Vanderhoof	$48 000
3	Forest Health Hazard Mapping in Managed Stands	Fort St. James	$35 000
4	Development of Innovative Silvicultural Tactics for Special Use Management Zones	Mackenzie	$40 000
5	Operational Monitoring of Vegetation Management Treatments - NIVMA Program Participation	Dawson Creek	50 000
6	Operational Monitoring of Manual Vegetation Management Treatments - NIVMA Program Participation	Prince George	$30 000
7	Fertilization and Precommercial Thinning in Fire Origin Pine	Fort St. James	$36 120
8	Sulphur Fertilization of Lodgepole Pine –	Vanderhoof	$35 000
9	Efficacy of Herbicide Applications for Operational Brushing - NIVMA Program Participation	Prince George	$30 000
10	Operational Monitoring of broadleaf/conifer interactions for managed stand decision support	Prince George	$50 000
11	Mammal Species in Young Lodgepole Pine Stands –	Vanderhoof	$15 000
12	Monitoring of Silvicultural Intervention impact on Fur-Bearer Populations and their Habitat	Prince George	$10 000
13	Mechanical Site Preparation Study	Vanderhoof	$52 000
14	Efficacy of Backlog NSR Site Preparation and Fill-Planting Tactics	Prince George	$10 000
15	The Potential of Organic (Sewage) Biosolids Waste Disposal on Growth of Juvenile and Pole Stand Forest Crops	Prince George	$10 000
		Total	**$511 120**

11.5 STRENGTHENING SUSTAINABLE FOREST MANAGEMENT RESEARCHABLE ISSUES

Table 11.4 Researchable Knowledge Strategies Recommended in SSFM Investments.

Issue #	Issue	Strategy ID	Knowledge Strategy
2	Incomplete Caribou Management Objectives	A	Caribou Management Decision Model Development
3	Lack of Species-at-risk Management Objectives	C	Species-at-risk Projection Model Development
4	Lack of General Wildlife Habitat Management Objectives	C	Wildlife Habitat Decision Model
5	Unknown Natural Disturbance, Biodiversity and Natural Successional Dynamics Benchmarks	A	Natural Disturbance Problem Analysis
7	Incomplete Fish and Fish Habitat Objectives	C	Fish/Fish Habitat Habitat Modelling
8	Incomplete Understanding of Mixedwood Stand Dynamics and Management Objectives	B	Mixedwood Problem Analysis/Local Research
		C	Mixedwood Model Development and Extension
9	Lack of Pest Management Decision Tools	B	Pest Management Decision Tool Development
11	Lack of Alternative Harvesting Experience	B	Alternative Harvesting Local Trials
12	Lack of Archaeological Value Preservation Objectives	C	Archaeological Values Decision Tools Development
14	Inadequate Understanding of Managed Stand Site Productivity Potential	B	Site Productivity Gap Research

12 APPENDICES

12.1 PRINCE GEORGE REGIONAL RMP GROUNDRULES APPENDIX

12.1.1 INTRODUCTION

The purpose of this document is to lay the ground rules for developing the 2001-2002 Resource Management Plan (RMP) in the Omineca-Peace / Prince George Forest Region. The RMP will identify resource priorities for (1) Forest Renewal, (2) Ministry of Environment, Lands and Parks (MoELP), and the Ministry of Forests (MoF).

The majority of information in this document pertains to Forest Renewal's requirements of the RMP. However, seven components of the RMP lie outside of Forest Renewal's funding envelope and details of these ineligible activities are outlined in section 12.1.4 of this Appendix.

The primary goal of the RMP is to identify key technical forest resource and environmental management opportunities and prioritise the activities on a management unit level. As a part this, the agencies will recommend investment opportunities which are in support of Forest Renewal's strategic objectives and are eligible for funding.

Development of the RMP will be through a collaborative and consultative process with multi-year and annual agreement holders as well as other directly affected stakeholders.

12.1.2 ORGANIZATIONAL STRUCTURE

The completion deadline for the RMP is September 30, 2000. In order to meet this deadline, a *Steering Committee* has been established, consisting of representatives from Forest Renewal BC, MoF, the MoELP, and consultants acting as their designates. This steering committee co-ordinates three *Technical Planning Committees*, representing (1) Sustainable Harvest, (2) Enhancing Environmental Values, and (3) Strengthening Sustainable Forest Management.

Omineca/Peace RMP Steering Committee

This steering committee will monitor the development of each component of the RMP at each planning level to ensure process, content and timelines compliance.

Sustainable Harvest Technical Planning Committee

Les Herring is the co-ordinator for this committee, and he will ensure the regional summary of district RMP's reflect local issues and priorities.

Strengthening Sustainable Forest Management Technical Planning Committee

This planning team will develop the regional SSFM plan in co-operation with local, district planning committees. The co-ordinator position for this committee has not yet been filled.

Enhancing Environmental Values Regional Planning Team

This planning team will develop the regional EEV plan in co-operation with local, district planning committees. Tim Silbernagel is the co-ordinator for this committee.

The MoF Districts will each be required to form their own *District Planning Teams*, which will report to the appropriate *Technical Planning Committee*. These local teams may be structured at the discretion of the District Manager.

Figure A-1 shows the organizational layout for developing the RMP, and lists the members that comprise the three *Technical Planning Committees* and the *Steering Committee*.

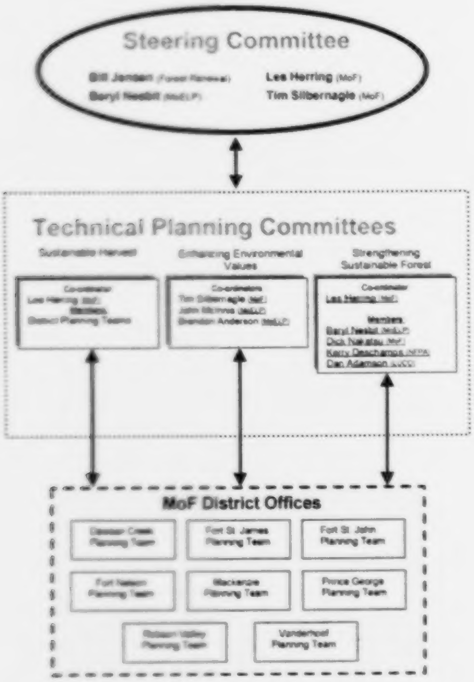
Steering Committee
Bill Jensen (Forest Renewal)
Beryl Nesbit (MoELP)
Les Herring (MoF)
Tim Silbernagle (MoF)
Technical Planning Committees
Sustainable Harvest
Co-ordinator
Les Herring (MoF)
Members
District Planning Teams
Enhancing Environmental Values
Co-ordinators
Tim Silbernagle (MoF)
John McInnes (MoELP)
Brendon Anderson (MoELP)
Strengthening Sustainable Forest
Co-ordinator
Les Herring (MoF)
Members
Beryl Nesbit (MoELP)
Dick Nakatsu (MoF)
Kerry Deschamps (NFPA)
Dan Adamson (UCC)
MoF District Offices
Dawson Creek Planning Team
Fort St. James Planning Team
Fort St. John Planning Team
Fort Nelson Planning Team
Mackenzie Planning Team
Prince George Planning Team
Robson Valley Planning Team
Vanderhoof Planning Team

Figure A-1 **Organizational Structure for 2001/02 RMP Development**

12.1.3 REGIONAL GROUND RULES DOCUMENT

Forest Renewal BC's Funding and Performance Measures

One of the first steps in developing the RMP is the allocation of funds for the 2001-2002 period. Forest Renewal BC has set the total budget for the Omineca-Peace region at $40.957 million. A breakdown of this budget by Strategic Objective is presented in Appendix One, and a breakdown by planning unit is presented in Appendix Two.

In order to ensure that Forest Renewal BC is meeting its targets for each Strategic Objective, it has established performance measures (for further details, please see

Strategic Plan 1999-2003). These measures are outlined in Appendix Three and must be followed.

Roles, Responsibilities and Expectations (Agencies and Stakeholders):

MoF and MoELP, as stewardship agencies, are responsible for identification and prioritization of resource management investment opportunities. This includes involvement of agreement holders and others with relevant technical expertise.

Forest Renewal BC, as an investment agency, is responsible for selection of investments and for ensuring overall accountability of these investments. This includes informing interested parties (industry, labour, First Nations, environment, community, and government organizations) about the overall process and opportunities for involvement.

The working relationships must be clear in order to co-ordinate and produce a comprehensive and useful RMP within the planning timeframe. Together, the Agencies and Forest Renewal must display a solid and cohesive approach to leading the RMP planning process which is fundamental to Forest Renewal's strategic planning approach.

Forest Renewal BC will:

- participate as a member of each of the *Steering Committee*.
- participate in *Technical Planning Committee* and *District Planning Team* meetings on request or invitation by committee leaders.
- monitor progress of RMP process.
- provide information, clarification and direction regarding the planning process, to MoF and MoELP as required, or requested.

The Ministry of Forests will:

- work co-operatively with MoELP to co-ordinate, plan and deliver the RMP to Forest Renewal within the established timeframes.
- provide the secretariat to prepare the regional RMP for submission to Forest Renewal BC.
- keep Forest Renewal BC informed of RMP planning meetings in the districts and region.
- conduct the RMP planning process in accordance with the *Guidelines for the Development of Resource Management Plans for 2001/02*, the "Guidelines" for each RMP component and the regionally established Ground Rules.
- participate in the technical planning committees (SH, SSFM and EEV).
- participate in the district planning team meetings on request or invitation by committee leaders.
- provide technical support to Forest Renewal as required by participating in the planning unit meetings to present the RMP to a local stakeholder representation that meets Forest Renewal's broader social, employment and partnership objectives.

The Ministry of Environment, Lands and Parks will:

- work co-operatively with MoF to co-ordinate, plan and deliver the RMP to Forest Renewal within the established timeframes.
- conduct the RMP planning process in accordance with the *Guidelines for the Development of Resource Management Plans for 2000/01*, the Guidelines for each RMP component and regionally established Ground Rules.
- keep Forest Renewal BC informed of RMP planning meetings in the districts and region.
- participate in the technical planning committees (SH, SSFM and EEV).
- provide technical support to Forest Renewal as required by participating in the planning unit meetings to present the RMP to a local stakeholder representation that meets Forest Renewal's broader social, employment and partnership objectives.

Multi-Year Agreement Proponents may:

- participate in the process at the district planning team level, in association with MoF and MoELP to identify and prioritize all resource management needs for their management unit, including those within and outside the scope of FRBC strategic objective.
- represent the forest licensee's resource management needs and priorities in the development of the RMP.
- represent the interests of associated directly affected stakeholders and implementing partners in the RMP process.
- collaborate with agencies to recommend land based investments that meet Forest Renewal's goals and objectives as outlined in the various RMP planning documents for 2001/02.
- respond to requests for information, input, review and comment in a timely manner, as requested by local, district RMP planning committees, to support the agencies in developing the RMP.

NOTE: Directly Affected Stakeholders may also participate in the RMP process at the *District Planning Team* level.

12.1.4 RMP COMPONENTS AND THE DIVISION OF RESPONSIBILITIES

This section describes the 10 components making up the 2001/02 RMP, and specifies the division of responsibility for each component. As mentioned in the introduction, some of the activities are ineligible for Forest Renewal funding, but must be completed as part of the RMP. Table A-1.1 presents an eligibility list for the RMP components.

The division of responsibilities between the *Technical Planning Committees* and the *District Planning Teams* are described below, for each component of the RMP. To avoid confusion between the three organizational levels involved in the development of this RMP, please refer to Figure A-1 of this document.

Table A-1.1 RMP Eligibility list for Forest Renewal BC Funding

Eligible for Forest Renewal BC funding	Eligibility is Project Specific	Ineligible for Forest Renewal BC funding
Sustainable Harvest	Resource Inventories	Current Reforestation
Enhancing Environmental Values	Research	Forest Health Maintenance
Strengthening Sustainable Forest Mgmt.		Recreation
		Forest Service Roads and Bridges
		Non-Status Roads

Sustainable Harvest Component

Enhanced forestry, backlog silviculture and forest health enhancement activities making up this component of the RMP must be developed within the context of the management unit (TSA, or MoF forest district). The *District Planning Teams* will therefore assume the lead role for developing this component, and will produce a district RMP to submit to the *Sustainable Harvest Technical Planning Committee*.

The "10 Principles of Partner Involvement in Resource Management Planning" (Appendix A-1.4) must be applied by the *District Planning Teams* during development of this component.

From each district RMP, activities, issues and priorities will be merged into a regional priorities list by the co-ordinator of the *Sustainable Harvest Technical Planning Committee*. From this priority list, elements which are eligible for Forest Renewal Sustainable Harvest investments will be identified, and recommended as investment priorities for 2001/02.

Strengthening Sustainable Forest Management Component

This RMP component is intended to identify and assign priorities to knowledge required to manage all forest resources. The *Technical Planning Committee* for Strengthening Sustainable Forest Management will assume the lead role in developing this component, while *District Planning Teams* will provide local context and management unit specific input. It is therefore essential that communication and liaison be established between these two organizational levels early in the planning process.

The "10 Principles of Partner Involvement in Resource Management Planning" (Appendix 4) must be applied at both planning levels (district and region) during development of this component. The district and regional SSFM plan will identify Forest Renewal investment priorities for 2001/02.

Enhancing Environmental Values

This RMP component addresses two elements: FRBC priority watershed planning; and other, local watershed-related resource issues. A *Technical Planning Committee* will assume the lead role in developing the priority watershed element, with local involvement of *District Planning Teams* where required. The *District Planning Teams* will focus on locally important stewardship issues and needs which fall outside of the strategic and funding criteria of Forest Renewal BC.

The "10 Principles of Partner Involvement in Resource Management Planning" (Appendix 4) must be applied at both planning levels (district and region) during development of this component. The regional EEV plan will identify Forest Renewal investment priorities for 2001/02.

Current Reforestation

This RMP component falls outside of Forest Renewal BC's funding criteria and is MoF led. The *District Planning Teams* will therefore assume the lead role for developing this component.

The involvement of partners is at the discretion of each *District Planning Team*, although partner review of the Current Reforestation Plan is encouraged.

From each district RMP, activities, issues and priorities will be merged into a regional priorities list by the Regional Current Reforestation Co-ordinator *(??who is it and where do we identify this information??)*

Forest Health Maintenance

This RMP component falls outside of Forest Renewal BC's funding criteria and is MoF led. The *District Planning Teams* will therefore assume the lead role for developing this component.

The involvement of partners is at the discretion of each *District Planning Team*, although partner review of the Forest Health Maintenance Plan is encouraged.

Recreation Site and Trail Maintenance

This RMP component falls outside of Forest Renewal BC's funding criteria and is led by MoF. The *District Planning Teams* will therefore assume the lead role for developing this component.

The involvement of partners is at the discretion of each *District Planning Team*, although partner review of the Recreation Plan is encouraged.

Forest Service Roads and Bridges

This RMP component falls outside of Forest Renewal BC's funding criteria and is led by MoF. The *District Planning Teams* will therefore assume the lead role for developing this component.

The involvement of partners is at the discretion of each *District Planning Team*, although partner review of the Forest Service Roads and Bridges Plan is encouraged.

Non-status Roads

This RMP component falls outside of Forest Renewal BC's funding criteria and is led by MoF. The *District Planning Teams* will therefore assume the lead role for developing this component.

The involvement of partners is at the discretion of each *District Planning Team*, although partner review of the Non-Status Roads Plan is encouraged.

Resource Inventories

This RMP component covers areas that are both eligible and ineligible for Forest Renewal funding, and should be determined on a project by project basis. Activities that fall outside of Forest Renewal BC's funding criteria will be led jointly by MoF and MoELP. The *District Planning Teams* will therefore assume an integral role in developing this component.

The involvement of partners is at the discretion of each *District Planning Team*, although partner review of the Resource Inventories Plan is encouraged.

Liaison between the *District Planning Teams* and the SSFM *Technical Planning Committee* is strongly recommended.

Research

This RMP component is intended to identify operational and higher levels of research need in resource management. The responsibility for developing this component is shared at all planning levels.

Each *District Planning Team* will identify research issues within all other RMP components, and within the context of local, management unit issues.

A review of research needs will also be completed at the regional and provincial levels.

District Planning Teams should ensure communication and liaison between MoF regional research staff so that research priorities identified at the regional level reflect local operational needs, as well as to ensure that ongoing or planned research at regional, provincial or international levels is considered at the local management unit level. A preliminary list of local research needs must be developed by July 12.

12.1.5 INTER-AGENCY AND STAKEHOLDER COMMUNICATION

It is important to establish a clear communication strategy between Forest Renewal BC, MoF, MoELP and the directly affected stakeholders to ensure timely, consistent and complete information is available to all participants.

For each *Technical Planning Committee*, MoF and MoELP will:

- identify theMoF primary contact and alternate for the *Technical Planning Committee*.
- identify the MoF primary and alternate contact for each *District Planning Team.*
- identify the MoELP primary contact and alternate for the *Technical Planning Committee*.
- develop the distribution lists by *District Planning Team* and by all participants, in order to disseminate information (e.g. updates, questions/answers, meetings).
- identify relevant MoF and MoELP staff and alternates for each planning unit.

The Ministry of Forests and Environment will schedule meetings of steering committee (conference call or other) every second week for progress or issues.

District planning committees and regional planning teams must include in an Appendix to each of the planning components, a list which indicates the names and organizations of committee or team members, people invited to provide input and/or feedback, and people who actually did provide input/feedback. All documentation of partner involvement should be included in these Appendices, such as meeting minutes, submissions of input and feedback received, notes on comments received by phone, etc..

12.1.6 DIRECTLY AFFECTED STAKEHOLDERS

Forest Renewal's planning processes must be transparent. Stakeholders who are directly affected by the RMP will have an opportunity to participate in the planning process. This is required for the Sustainable Harvest, Enhancing Environmental Values, and Strengthening Sustainable Forest Management components of the RMP. Stakeholder participation in the remaining components of the RMP is at the discretion of each *District Planning Team*.

The agencies, Forest Renewal and proponents in each planning unit will identify the directly affected stakeholders in each planning unit. Directly affected stakeholders may include but not be limited to, MYA and AA proponents, implementing partners, TFL's, Woodlot Associations, IFPA's, EFMPP's, TRIM II, CLUPE, DFO, Fisheries Renewal, First Nations partners and proponents.

Also, a set of 10 principles have been developed to provide guidance for partner involvement in the development of the RMP, and are consistent with provincial standards. These principles are presented in Appendix A1.4 of this document and should be followed.

12.1.7 CONSENSUS AND CONFLICT RESOLUTION

Forests and Environment will provide Forest Renewal BC with a list of recommended resource priorities by region and/or management unit, guided by the corporate strategic objectives, planning criteria, performance measures, and funding targets and which has consensus or significant general agreement to by the stakeholder participants.

Consensus will be discussed at the planning unit initiation meetings to ensure a clear understanding of the requirement among the participants. Generally, consensus is finding a proposal acceptable enough that all members can support it; no member opposes it.

While planners must ensure the planning process reflects the principles of partner involvement appropriate to the RMP component, the process is unlikely to guarantee consensus in either the identification of needs, or priorities amongst needs within each resource component. *District Planning Team* leaders and *Technical Planning Committee* co-ordinators should therefore document within the RMP, areas of disagreement amongst planning participants.

If consensus cannot be reached, identify the disagreeing parties, the issues, and what steps were taken to resolve the dispute. The committee co-ordinator/team leader will provide a recommendation to Forest Renewal. If all else fails, it is suggested that you follow the steps for conflict resolution outlined below.

There three recommended steps to resolving conflicts:

- Informal resolution among the parties (using constructive, interest-based negotiation)
- Resolution by the senior regional administrators for each of the respective agencies.
- Resolution by Assistant Deputy Minister level representatives of the agencies.

12.1.8 TIMELINES AND MILESTONES

All committees, planning teams will need to co-ordinate their activities to ensure the RMP completion schedule indicated in Table A-1.2.

Table A-1.2 RMP Timelines and Milestones

Milestone	Date
Submission of preliminary research priorities to SIFERP	July 12
Submission of interim draft of all *District Planning Teams* RMP components to the respective *Technical Planning Committee.*	August 27
Submission of final *District Planning Teams* RMP to the respective *Technical Planning Committee.*	September 15
Submission of RMP components from each *Technical Planning Committee* to Forest Renewal BC.	September 30

12.1.9 REPORTING REQUIREMENTS

The key RMP contacts for co-ordination of the roll up and submission of the RMP are Les Herring (MoF) and Beryl Nesbit (MoELP). As a part of the Services Agreement, the ministries will maintain a record of the RMP development process with appropriate documentation.

District planning committees and regional planning teams must include an appendix to each of the planning components which indicate the names and organizations of committee or team members, people invited to provide input and/or feedback, and people who actually did provide input/feedback.

Documentation of partner involvement, district planning committees and regional planning teams must indicate the names and organizations of committee or team members, people invited to provide input and/or feedback, and people who actually did provide input/feedback. All documentation of partner involvement, such as meeting minutes, submissions of input and feedback received, notes on comments received by phone, etc. should be included in these appendices.

12.1.10 RMP FORMAT/SUBMISSION

The RMP format and submission criteria will be consistent with the Provincial Resource Management Plan Guidelines document and corresponding guidelines for each Strategic Objective and with this "Ground Rules" document.

A consultation report with directly affected stakeholders will be required as an appendix to the RMP submission.

The *Steering Committee* will jointly prepare an executive summary presentation of the RMP to Forest Renewal BC regional office as a part of their joint submission.

12.1.11 APPENDIX A-1.1 2001/2002 BUDGET BY STRATEGIC OBJECTIVE

Omineca – Peace Region[59]

Strategic Objective	Allocation($ millions)
Sustainable Harvest	22.992
Enhance Environmental Values	4.399
Strengthen Sustainable Forest Management	13.566

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[59] Does NOT include funding allocation for Provincial Initiatives

12.1.12 APPENDIX A-1.2 2001/2002 ALLOCATION BY PLANNING UNIT

Omineca – Peace Region

Planning Unit	**Multi Year Allocation ($)**[60][61]
Prince George	$8,957,501
Robson Valley	$1,094,500
Vanderhoof	$3,822,000
Fort St. James	$5,572.001
Mackenzie	$5,273,420
Dawson Creek	$3,856,428
Fort St. John	$2,587,000
Fort Nelson	$2,686,500
Critical Annual Dollars – Across All Units	$3,113,993

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[60] Funding does not include Ministry's allocations, Regionally Scoped Projects and provincial projects.

[61] Currently annual funding has not been entirely committed in formal agreements.

12.1.13 APPENDIX A-1.3 PERFORMANCE MEASURES

Forest Renewal, in co-operation with our partners, will continue to develop the analytical tools necessary to properly integrate return on investment criteria into the planning process. At this time we are confident the existing tools, resource management plans, and cumulative staff experience of Forest Renewal, industry, ministry and other stakeholder groups will make the best approximation of funding distribution next year to enable achievement of the strategic objectives. Professional foresters, engineers, geoscientists and biologist will be called upon to provide professional advice on specific investment projects.

Strategic Objective One: Sustainable Harvest

Investments in this objective are targeted at both the volume an value of second growth timber that will be available for future harvest.

Key Target: Between 2000-2005, increase province wide timber available for potential harvest by 25 million cubic meters. In the Omineca-Peace Region, the indicated opportunity, which is to be used as targets for planning purposes, is 9.5 million cubic meters.

Critical Outputs:

- The economic value of timber on all enhance forestry treatment areas be increased by between 5% and 30%;
- Silviculture investment decisions will be guided by forest level stewardship plans in 100% of management units;
- Planned activities must have reasonable cost estimates within regionally relevant cost guidelines; and
- Focus on positive changes for the planning unit as a whole.

Strategic Objective Two: Enhancing Environmental Values

Investments in this objective are targeted at restoring and enhancing environmental values of the forest, particularly through watershed restoration.

Key Target: Between 2000-2005, Forest Renewal BC will work with our partners to restore 20% of the high priority key watersheds in each region damaged or seriously threatened by past forest harvesting activities. Focus is on prevention or reduction of damage to fisheries and aquatic resources (including water quality) in high priority watersheds.

Critical Outputs for 2001/2002:

- Regional identification and ranking of key watersheds, i.e. a regional benchmark of high priority key watersheds, which has been developed jointly by MOELP and MOF.
-

The key products required for sound benchmarks are:

- Clear documentation of the process – including stakeholder consultation – used to develop the benchmark;
- regional criteria for identifying target fish species / stocks of concern;
- list of target fish species / stocks for the region and rationale for selection;
- map (GIS based) of the major watershed units for the region;

- list and map of regionally significant watersheds for target fish species or stocks / domestic water (i.e. key watersheds for the region);
- ranked (i.e. VH,H,M) list and map of key watersheds with a rationale for ranking;
- list and map of category I, II watersheds (i.e. VH, H, priority watersheds with good chance of success).
- Assessment of the watershed units in each district / planning unit against the regional benchmark. Minimum information requirements are listed in Table 2 of the guidelines.
- Recommended list and amp showing transition work to be completed by March 31, 2001.
- Recommended list and map of priority key watershed to target for completion over the next five years.

Strategic Objective Three: Sustainable Forest Management

Investments in this objective are targeted at improving the information, knowledge and skills necessary for sustainable forest management.

Key Target: Between 2000-2005, Forest Renewal BC will work with partners to identify and address key gaps in knowledge directed to achieving sustainability for upcoming TSRs and for strategic land us plans such as LRMPs that are underway.

Critical Outputs for 2001/2002:

The critical output is a prioritised list of technically feasible, strategically important activities for the region. This list must include:

- Current, continuing activities identified as high priorities by the resource management agencies,
- Transition activities which are not consistent with the Forest Renewal BC strategic objective, but for which funding is required to complete existing commitments, and
- New activities, consistent with the Forest Renewal BC strategic objective, that are funding priorities.
  Activities should be identified as inventory, research, or informal

12.1.14 APPENDIX A-1.4 PRINCIPLES FOR PARTNER INVOLVEMENT IN RESOURCE MANAGEMENT PLANNING

The following ten principles are designed to support sound partner involvement and participation in the *Technical Planning Committees* (SH, SSFM and EEV), and the respective *District Planning Teams* are expected to reflect these principles in their resource management planning process.

1. Linkage with Higher Level Planning

RMP's must be consistent with higher level plans. Representatives of LRMPs (Land and Resource Management Plans) and Strategic Land Use Plans are invited to participate in annual evaluations of the overall resource management and investment planning.

Performance measure: participants in annual evaluations indicate that RMPs and investment plans are consistent with the intent of higher level plans.

2. Who Is Invited to Participate

Those who have relevant technical expertise should be invited to participate in development of local and regional RMPs. Industry, labour, First Nations, environment, community, and government organizations may be invited to participate at the discretion of the RMP planning committee.

Performance Measure: The RMP appendices must show that those with relevant technical expertise were invited to provide input and feedback in RMP development. The documentation needs to show that government, First Nations, community, industry, labour, and environmental organizations were invited to participate in investment planning and/or in evaluation of the overall process.

3. Resource Management Planning Transparency

Interested parties should be invited to contribute input and/or feedback are informed of how such information will be used and how it fits into the overall planning cycle. FRBC informs ministries of criteria used in investment planning.

Performance measures: participants indicate that they felt well informed about the process context and the planned use of their input/feedback; ministries indicate adequate understanding of investment planning criteria.

4. Partner Involvement in *Technical Planning Committees* & *District Planning Teams*

The degree of involvement being invited at various stages is explicit. Those invited to participate are informed of whether their role is to provide advice, to directly participate in decision making, or to review and provide comment. Providing information without intent to use input/feedback is not involvement.

Performance measure: participants indicate a clear understanding of the level(s) of involvement being invited.

5. Diversity of Opportunities

There are a variety of opportunities for involvement. The RMP process is designed to accommodate the diverse ways that people receive and provide information and the variety of desired levels of involvement.

Performance measure: individuals within categories of intended participants indicate that they perceived appropriate options in the type and level of their involvement.

6. Plain Language

Technical terms and acronyms are defined or explained. To create fair opportunities for participation, technical terms and acronyms are clearly defined and/or explained in plain language.

Performance measure: plans and presentation materials are tested on non-experts and necessary clarifications are made.

7. Utility

Involvement in planning is designed to be productive. Input and feedback is gathered when there are clear intentions and plans for use of that information.

Performance measure: input and feedback is systematically documented, analyzed, and considered in decision making.

8. Public Accountability

Planning processes are designed to maximize the effectiveness and efficiency of public investments in resource management. Agreement holders and other invited parties provide input and feedback for the purpose of contributing to the public interest.

Performance measure: government agencies observe a shift of planning focus from inputs and private interests to outcomes and the public interest.

9. Closing the Loop

The communication loop gets closed. Feedback/input is thoroughly documented and made available to participants. Participants are informed of how their input/feedback has been used.

Performance measure: each effort to gather opinion is followed by efforts to inform participants of findings and how these have been used.

10. Process Development

Planning processes are continuously improved. Interested parties are invited to provide input and feedback on the planning process itself.

Performance measure: process evaluation is included as a component in each involvement exercise.

12.2 SUSTAINABLE HARVEST APPENDICES

12.2.1 MANAGEMENT UNIT RMP SUPPORT PERSONNEL AND CONSULTATION REPORTS

12.2.1.1 PRINCE GEORGE FOREST DISTRICT

District Planning Team Leader:

Bob Richards, Zone Officer

Table A-2.2.1 Stakeholder Collaboration – Prince George TSA Strategic Silvicultural Plan

Participant's Name	Organization	Participant's Name	Organization
Bob Richards	MoF Prince George F.D.	Earl Wilson	MoF
Jay Hallett	Avison Management Services	Keith Gordon	MoF, Fort St. James F.D.
Janice Thurston	Slocan – Plateau	Gord Dow	MoF, Prince George F.D.
Greg Van Dolah	Fraser Lake Sawmills	Susan Salokannel	MoF
Peter Forsythe	The Pas Lumber	Shannon Carson	MoF, Prince George F.D.
Mario Di Lucca	MoF Research Branch	Norm Fallows	MoF, Vanderhoof F.D.
Alison Newbery	Carrier Lumber Ltd.	Dave Sommerville	MoF, Vanderhoof F.D.
Doug Perdue	Dunkley Lumber Ltd.	Chris Ritchie	MELP
Wilf Goerwell	Tanizul Timber Ltd.	Dave King	MELP
Brian Harding	Prince George Woodlot Assoc.	Phil Zacharatos	MoF, Prince George F.D.
Rein Kahlloe	Canfor	Mike Joles	North Fork Forestry (for Lakeland)
		Brian Walker	Fraser Lake Sawmills / West Fraser

Table A-2.2.2 **Forest Renewal Sustainable Harvest Consultation Report – Prince George Forest District**

Stakeholders	Method	Date	Response	RMP Issues Identified?	Steps for Resolution	Outstanding Issue?
Canadian Forest Products (Kerry Deschamps)	X Phone X Email X Meeting (Individual) X Meeting (group)	July 5,2000	YES	None	N/A	**NO**
Carrier Lumber Ltd. (Mike Trepanier)	X Email X Meeting (group)	July 5,2000	YES	None	N/A	**NO**
Dunkley Lumber (Doug Perdue)	X Phone X Email	July 5,2000	NO	None	N/A	**NO**
Lakeland Mills Ltd. (Mike Joles)	X Email X Meeting (group)	July 5,2000	YES	None	N/A	**NO**
Thr Pas Lumber (Dan Upward)	X Phone X Email X Meeting (group)	July 5,2000	YES	None	N/A	**NO**
Prince George Woodlot Assoc. (Brian Harding)	X Phone X Email X Meeting (group)	July 5,2000	YES	None	N/A	**NO**

12.2.1.2 ROBSON VALLEY FOREST DISTRICT

Disrict Planning Team Leader:

Norma stromberg-jones, Forest Practices Code Officer

Table A-2.3.1 Stakeholder Collaboratoration – Robson Valley TSA Strategic Silvicultural Plan

Participant's Name	Organization
Dorothy Wharton,	Robson Valley Forest District
Wendy Hutchison	Robson Valley Forest District
Jeff Beale	Robson Valley Forest District
Dave Coish	Robson Valley Forest District
Norma Stromberg-Jones	Robson Valley Forest District
Ainslie Robson	Hauer Bros. Lumber Ltd.
Chris Ritchie	MELP
Greg Clements	Robson Valley Forest District
Dwight Wolfe	The McGregor Group
Steve Voros	The McGregor Group
Les Herring	Prince George Forest Region
Steve Day	Slocan Forest Products, Valemont
Helmuth Mueller	McBride Forest Company (Zeidler)

Table A-2.3.2 Forest Renewal Sustainable Harvest Consultation Report – Robson Valley Forest District

Stakeholders	Method	Date	Response	RMP Issues Identified?	Steps for Resolution	Outstanding Issue?
Slocan Forest Products Ltd. Valemount Division Tony Bild	☐ Phone ☐ Email ☐ Meeting (Individual)	Sept. 12 Sept. 14 Sept. 11	☐ YES ☐ NO	Needed clarification of required inputs for eev_table3ab.xls. Work already accomplished or works to be done?	Peter Wright tried to contact Tim Silbernagel, regional watershed technician but he was not in the office. Will try again.	YES
				Cost for brushing is too low. Should be $1000/ ha based on current contracts.	Changed unit cost in plan.	NO
Hauer Bros. Lumber Ltd. Ainslie Jackman	☐ Fax	Sept. 14	☐ YES ☐ NO	Hauer Bros. does not have a MYA but is willing to act as an implementation contractor for other licensees	No action needed.	NO
McBride Forest Industries Ltd. Craig Pryor	☐ Email	Sept. 14.	☐ YES ☐ NO	A small amount of pruning should be included as licensee wants to include it in their silviculture program and pruning is in the Type 1 analysis	Added 20 ha pruning to plan.	NO
				Fill planting cost may be a bit low.	No change to plan. Monitor for next RMP.	NO

12.2.1.3 VANDERHOOF FOREST DISTRICT

District Planning Chair:

Delee Anderson, Zone Forester, Silviculture

Table A-2.4.1 Stakeholder Collaboration – Prince George TSA Strategic Silvicultural Plan

Participant's Name	Organization	Participant's Name	Organization
Bob Richards	MoF Prince George F.D.	Earl Wilson	MoF
Jay Hallett	Avison Management Services	Keith Gordon	MoF, Fort St. James F.D.
Janice Thurslon	Slocan – Plateau	Gord Dow	MoF, Prince George F.D.
Greg Van Dolah	Fraser Lake Sawmills	Susan Salokannel	MoF
Peter Forsythe	The Pas Lumber	Shannon Carson	MoF, Prince George F.D.
Mario Di Lucca	MoF Research Branch	Norm Fallows	MoF, Vanderhoof F.D.
Alison Newbery	Carrier Lumber Ltd.	Dave Sommerville	MoF, Vanderhoof F.D.
Doug Perdue	Dunkley Lumber Ltd.	Chris Ritchie	MELP
Wilf Goerwell	Tanizul Timber Ltd.	Dave King	MELP
Brian Harding	Prince George Woodlot Assoc.	Phil Zacharatos	MoF, Prince George F.D.
Rein Kahlloe	Canfor	Mike Joles	North Fork Forestry (for Lakeland)
		Brian Walker	Fraser Lake Sawmills / West Fraser

Table A-2.4.2 Forest Renewal Sustainable Harvest Consultation Report – Vanderhoof Forest District

Stakeholders	Method	Date	Response	RMP Issues Identified?	Steps for Resolution	Outstanding Issue?
Plateau Forest Products Ltd. (Janice Thurston) L&M Lumber Ltd. (Peet Vahi) Canadian Forest Products Ltd. (Kerry Deschamps)* *participated by fax/speaker phone	☐ Meeting (Igroup	2000/09/12 13:30, AMS Office	☐ **YES**	Discussed activity tables, priority between backlog and enhanced program.	Stakeholders to review and provide input for appropriate activity levels.	**NO**
				Discussed upper limit for funding under SH component.	Adjust activity levels to achievable levels.	**NO**
				Discussed proposed silviculture studies for inclusion in RMP.	Some stakeholders to provide summaries of silviculture studies.	**NO**
Plateau Forest Products Ltd. L&M Lumber Ltd. Canadian Forest Products Ltd. West Fraser Mills Ltd. (Greg Van Dolah)	☐ **Email**	2000/09/15	☐ **YES**	Revised tables sent out for review as funding level above discussed limit.	Stakeholders to review and provide input.	**NO**
Plateau Forest Products Ltd.	☐ **Email**	2000/09/18	☐ **YES**	Email from Janice regarding which activities should be reduced to achieve funding limit.		**NO**
West Fraser Mills Ltd.	☐ **Phone**	2000/09/18	☐ **YES**	Phone call from Greg regarding activity levels to reduce.		**NO**
				Also discussed several silviculture study projects.	Greg to provide summary information.	**NO**
L&M Lumber Ltd.	☐ **Phone**	2000/09/18	☐ **YES**	Phone call from Peet regarding activity levels to reduce.		**NO**

12.2.1.4 FORT ST. JAMES FOREST DISTRICT

District Planning Chair:
Susan Salokannel, Zone Forester

Table A-2.5.1 Stakeholder Collaboration – Prince George TSA Strategic Silvicultural Plan

Participant's Name	Organization	Participant's Name	Organization
Bob Richards	MoF Prince George F.D.	Earl Wilson	MoF
Jay Hallett	Avison Management Services	Keith Gordon	MoF, Fort St. James F.D.
Janice Thurslon	Slocan – Plateau	Gord Dow	MoF, Prince George F.D.
Greg Van Dolah	Fraser Lake Sawmills	Susan Salokannel	MoF
Peter Forsythe	The Pas Lumber	Shannon Carson	MoF, Prince George F.D.
Mario Di Lucca	MoF Research Branch	Norm Fallows	MoF, Vanderhoof F.D.
Alison Newbery	Carrier Lumber Ltd.	Dave Sommerville	MoF, Vanderhoof F.D.
Doug Perdue	Dunkley Lumber Ltd.	Chris Ritchie	MELP
Wilf Goerwell	Tanizul Timber Ltd.	Dave King	MELP
Brian Harding	Prince George Woodlot Assoc.	Phil Zacharatos	MoF, Prince George F.D.
Rein Kahlloe	Canfor	Mike Joles	North Fork Forestry (for Lakeland)
		Brian Walker	Fraser Lake Sawmills / West Fraser

Table A-2.5.2 Forest Renewal Sustainable Harvest Consultation Report – Fort St. James Forest District

Stakeholders	Method	Date	Response	RMP Issues Discussed	Steps for Resolution	Outstanding Issue?
UNBC-Canfor-S. Grainger Canfor-K. Deschamps MOF Research-C. DeLong MOF- L. Herring MOF-S. Salokannel All stakeholders were invited	☐ Phone ☐ Meeting (group)	July 7	☐ YES	SSFM Overview and direction	Formulate SSFM issues	NO
				Research presentation by C. Delong		
				K. Deschamps will sit on panel to sort priorities		
MOF LIM LRMP M. Slivitzky S . Salokannel	☐ Meeting (Individual)	July 10	☐ YES	Formulate SSFM issues		NO
Tim Silbernagle MOF John McInnes Tanizul P. Valk Canfor S. Flueck MOF DJA L Pletzer S. Salokannel	☐ Meeting (group)	July 13	☐ YES	EEV issues		NO
				Plan process and identified work areas		
S. Flueck Canfor S. Salokannel MOF	☐ Meeting (Individual)	July 13	☐ YES	SH; recreation; SSFM; FH		NO
Aboriginal Forestry Advisor B. Goerz S. Salokannel MOF	☐ Meting (Individual)	July 17	☐	SSFM issues		NO
MOF recreation K. Wagner S. Salokannel MOF	☐ ☐ Meeting (Individual) ☐	July 17	☐	Recreation issues		NO

Stuart Lake Lbr. D. Muddiman S. Salokannel MOF	☐ ☐ Meeting (Individual) ☐	July 18	☐	SH SSFM EEV		NO
Apollo Forest Products J. Marchal S. Salokannel MOF	Phone	July 18		SH, SSFM, EEV		NO
K. Deschamps Canfor S. Salokannel MOF	Phone	July 18		Using spread sheet from B. Richards		NO
Tanizul -P. Valk S. Salokannel MOF	Meeting (Individual)	July 18		Explained template for RMP submission		NO
Tanizul P. Valk	Phone Email (group)	July 20		Peter Valk submitted plan for goals and investment		NO
Canfor S. Flueck	Phone	July 26		Due to Canfor's late start with program they are having difficulty planning for next year's program		NO
Canfor S. Flueck	Phone	July 27		Canfor is too busy to provide input to RMP		NO
Stuart Lake Lumber	Meeting (Individual)	Aug. 15		SSFM - provide help in how to fill out 'issues forms'		NO
Canfor Apollo	Phone	Aug. 16	NO			NO
B. Baker SNWA	Phone Email	Aug. 16		Instructions re: template		NO
MOF, LIM, Aboriginal Affairs and SBFEP	Meeting (Individual)	Aug. 16		Explanation of criteria for SSFM		NO

Village of Fort St James Community Forest	Meeting (Individual)	Aug. 17		Explanation of criteria		NO
UNBC -Canfor	Phone	Aug. 17		Ensure input to Canfor's plan		NO
MOF, LIM, Aboriginal Affairs	Meeting (Individual)	Aug. 17		Help formulate issues		NO
Canfor	Phone Email	Aug. 17		Submitted FRBC goals & investment plan as a rough estimate.		NO
Community Forest	Phone	Aug. 18		SSFM issues		NO
B. Baker SNWA	Email	Aug. 18		How to fill out template		NO
Diane Reed MOF Rec	Meeting (Individual)	Aug. 29		Recreation opportunities spectrum		NO
Stuart Lake Lbr. -D. Muddiman	Phone	Sept. 5		Follow up on RMP input Introduced Brandon McDonald		NO
B. Goerz	Email	Sept. 6		Arch project – Level of detail?		NO

12.2.1.5 MACKENZIE FOREST DISTRICT

District Planning Chair:

Zoran Boskovic, FRP, Zone Forester

Table A-2.6.1 Stakeholder Collaboration – Mackenzie TSA Strategic Silvicultural Plan

Participant's Name	Organization
Stefan Tack	Mackenzie Forest District
Deepa Tolia	Mackenzie Forest District
Anna Ryhsburger	Slocan
Dwight Scott Wolfe	McGregor Group
Zoran Boskovic	Mackenzie Forest District
Dave Francis	Mackenzie Forest District
Doyal Keller	Mackenzie Forest District
Gai Wong	Mackenzie Forest District
Jim Tuck	MoELP
Shirley Gilmour	Donahue
Wayne Lewis	Donahue
Zorica Boskovic	Mackenzie Forest District
Dan Borlianne	Donahue
Erik Olson	Slocan
Lars Hustein	Slocan
Stephane Dube	Mackenzie Forest District

Table A-2.6.2 Forest Renewal Sustainable Harvest Consultation Report – Mackenzie Forest District

Stakeholders	Method	Date	Response	RMP Issues dentified?	Steps for Resolution	Outstanding Issue?
Donohue Forest Products Inc. (Shirley Gilmour)	Email, Phone, Individual Meeting, & Group Meeting	May & July	YES	No	NA	NO
Slocan Forest Products Ltd. Leslie Yaremko & Anna Rynsburger.	Email, Phone, Individual Meeting, & Group Meeting	May & July	Yes	Slocan expressed desire to reduce SH component and expand SSFM component.	None	YES

12.2.1.6 DAWSON CREEK FOREST DISTRICT

District Planning Chair:
Frank McAllister, Silviculture Officer

Table A-2.7.1 Stakeholder Collaboration – Dawson Creek TSA Strategic Silvicultural Plan

Participant's Name	Organization
Andrew Carveth	Chetwynd Forest Industries, (West Fraser Mills)
Mark Schoenberger	Chetwynd Forest Industries, (West Fraser Mills)
Don Scott	Chetwynd Forest Industries, (West Fraser Mills)
Mike Byl	Louisiana Pacific Corp.
Doug Russell	Louisiana Pacific Corp.
Rod Brooks	Louisiana Pacific Corp.
Don Rosen	Canadian Forest Products
Wes Neumeier	Canadian Forest Products
Les Herring	Prince George Forest Region
Frank McAllister	Dawson Creek Forest District
Elaine Amagost	Dawson Creek Forest District
Frances Hall	Dawson Creek Forest District
Carl Jahn	Dawson Creek Forest District
Regan Dickinson	Dawson Creek Forest District
Wojceich Szczesniak	Dawson Creek Forest District
Rod Kronlachner	Dawson Creek Forest District
Jacek Bankowski	Dawson Creek Forest District
Henry Hartmann	Dawson Creek Forest District
Danny Way	Dawson Creek Forest District
Paul Gevatkoff	Dawson Creek Forest District
Winn Hays-Byl	Dawson Creek Forest District
John Stevenson	Dawson Creek Forest District
Rod Backmeyer	Ministry of Environment, Lands and Parks

Table A-2.7.2 Forest Renewal Sustainable Harvest Consultation Report – Dawson Creek Forest District

Stakeholders	Method	Date	Response	RMP Issues Identified?	Steps for Resolution	Outstanding Issue?
Mike Byl, Louisiana-Pacific Canada Corp.	☒ Phone ☒ Email	July 19, 2000	☒ YES ☐ NO			NO
Carl Jahn, SBFEP	☒ Phone ☒ Email	July 19, 2000	☒ YES ☐ NO			NO
Brian Pate, Don Scott Chetwynd Forest Industries (West Fraser Mills)	☒ Phone ☒ Email	July 19, 2000	☒ YES ☐ NO			NO
Wes Neumeier, Dennis Sabourin Canadian Forest Products Ltd.	☒ Phone ☒ Email	July 19, 2000	☒ YES ☐ NO			NO
Rod Backmeyer, BC Environment	☒ Phone ☒ Email	July 19, 2000	☒ YES ☐ NO			NO

12.2.1.7 FORT ST. JOHN FOREST DISTRICT

District Planning Chair:

Brian Farwell, FRP Silviculture Officer

Table A-2.8.1 Stakeholder Collaboration – Fort St. John TSA Strategic Silvicultural Plan

Participant's Name	Organization
John Dymond	Slocan Group, Fort Nelson Woodlands
Mike Byl	Louisiana-Pacific Canada Ltd.
Greg Taylor	Canfor
Paul Perkins	Forest Renewal BC
Bill Jensen	Forest Renewal BC
Bill Williams	Industrial Forestry Services
Brian Farwell	MoF Fort St. John Forest District
Richard Kabzems	MoF Fort St. John Forest District
Janice Edwards	MoF Fort St. John Forest District

Table A-2.8.2 Forest Renewal Sustainable Harvest Consultation Report – Fort St. John Forest District

Stakeholders	Method	Date	Response	RMP Issues Identified?	Steps for Resolution	Outstanding Issue?
Scott Gordon Canadian Forest Products Ltd.	☐ Phone	September 13, 2000	☐ YES	None	N/A	NO

12.2.1.8 FORT NELSON FOREST DISTRICT

District Planning Chair:

Alena Terry, FRP Forester

Table A-2.9.1 Stakeholder Collaboration – Fort NelsonTSA Strategic Silvicultural Plan

Participant's Name	Organization
Diane Reed	Ministry of Forests
Mary Duda	Slocan Forest Products Ltd.
Steve Lindsey	Ministry of Forests
Rodger DeChamplain	Ministry of Forests
Jim Oskirko	Ministry of Forests
Steve Joyce	Ministry of Forests
Adrian Comas	Slocan Forest Products Ltd.
Keven Kuhn	Slocan Forest Products Ltd.
Daruyn Koch	Slocan Forest Products Ltd.
Patrick Asante	Slocan Forest Products
Tom Taylor	Ministry of Forests
Les Herring	Ministry of Forests
Liljana Kuezeni	Ministry of Forests
Tim Phillips	Ministry of Forests
Miles	Ministry of Forests
Doug Tofte	Slocan Forest Products

Table A-2.9.2 Forest Renewal Sustainable Harvest Consultation Report –Fort Nelson Forest District

Stakeholders	Method	Date	Response	RMP Issues Identified?	Steps for Resolution	Outstanding Issue?
Slocan Forest Products Ltd. Contact: Mary Duda	X Phone X Email X Meeting (Individual)	August 9, 2000	X YES ☐ NO	Defining what the Legal Obligations and Critical Backlog is.	Working together on the definitions	NO
				Backlog areas which must be funded while the VRI proceeds for the Fort Nelson District, for the next 3-4 years	Reconnaissance of Backlog areas to determine critical areas which require funding during the VRI process.	YES

12.3 CURRENT REFORESTATION APPENDICES

12.4 FOREST HEALTH MAINTENANCE APPENDICES

12.5 ENHANCING ENVIRONMENTAL VALUES APPENDICES

12.5.1 MANAGEMENT UNIT CONSULTATION REPORTS

Table A-5.1 Consultation Record for EEV RMP

Meeting Location: Prince George	**Date:** July 11, 2000	**Time:** 10:15
Participants: Laura Grafton – Chilacko Watershed Council Les Herring – Incremental Practices Forester, PG Region Kerry Deshamps – CanFor Brian Harding – Prince George Woodlot Association Mike Darin – Ministry of Forests, Prince George Bob Richards - Ministry of Forests, Prince George Mike Trepanier – Carrier Lumber Ltd. Tim Silbernagel – Ministry of Forests – region, Prince George John McInnis – Ministry of Environment, Lands and Parks – region, Prince George		
Meeting Location: McBride	**Date:** July 12, 2000	**Time:** 10:20
Participants: Ainslie Jackman – Hower Brother Lumber Peter Wright - Ministry of Forests, McBride Tony Bild – Slocan Forest Products Ltd. George Smith - Slocan Forest Products Ltd. Tim Silbernagel – Ministry of Forests – region, Prince George John McInnis – Ministry of Environment, Lands and Parks – region, Prince George		
Meeting Location: Fort St. James	**Date:** July 13, 2000	**Time:** 10:00
Participants: Peter Valk – Tanizal Lumber Ltd. Laurie Pletzer - Ministry of Forests, Ft St James Susan Flueck – CanFor Susan Salokannel - Ministry of Forests, WRP Coordiator - Ft St James Tim Silbernagel – Ministry of Forests – region, Prince George John McInnis – Ministry of Environment, Lands and Parks – region, Prince George		

<table>
<tr><td>**Meeting Location:** McKenzie</td><td>**Date:** July 18, 2000</td><td>**Time:** 10:20</td></tr>
<tr><td colspan="3">**Participants:**
Leslie Yaremko – Slocan Forest Products Ltd.
Shirley Gilmour – Donohue Forest Products Inc.
Corrina Hoffart - Donohue Forest Products Inc.
Jeff Kotowsky - Ministry of Forests, McKenzie
Tim Silbernagel – Ministry of Forests – region, Prince George
John McInnis – Ministry of Environment, Lands and Parks – region, Prince George</td></tr>
<tr><td>**Meeting Location:** Vanderhoof</td><td>**Date:** July 25, 2000</td><td>**Time:** 10:10</td></tr>
<tr><td colspan="3">**Participants:**
Janice Thurston – Plateau Forest Products Ltd.
Norm Fallows - Ministry of Forests, Vanderhoof
Scott McIntosh – Saik'uz First Nations
Peet Vahi – Avison Management Services (L&M Lumber Ltd)
Greg Van Dolah – Van Dolah Forestry (representing West Fraser Mills Ltd.)
Michelle - West Fraser Mills Ltd (last name unknown)
Tim Silbernagel – Ministry of Forests – region, Prince George
John McInnis – Ministry of Environment, Lands and Parks – region, Prince George</td></tr>
<tr><td>**Meeting Location:** Fort St John</td><td>**Date:** July 19, 2000</td><td>**Time:** 9:00</td></tr>
<tr><td colspan="3">**Participants:**
Paul Gevatkoff - Ministry of Forests, Dawson Creek
Graham Anderson - Ministry of Forests, Ft St John
Brian Pate - West Fraser Mills Ltd, Chetwynd Division
Brian Farwell - Ministry of Forests, Ft St John
Tim Silbernagel – Ministry of Forests – region, Prince George
Brendan Anderson - Ministry of Environment, Lands and Parks – region, Prince George</td></tr>
</table>

12.5.2 WATERSHED UNIT SUMMARY

Table A-5.2 Summary of All Watershed Units in the Prince George Forest Region.

#	MOF District	Watershed (Fish) Unit	Fish Species (Y/N)	Regional Priority for Fish (VH, H, M, L)	Regional Priority for Domestic Water Supply (VH, H, M, L)	Regional Category (1-5)	MYA # (for W's with active projects)	Name(s) of implementing partners	Transition watershed (Y/N)	Key Watershed (Y/N)	Priority Key Watershed (Y/N)
1	Robson Valley	Camp Creek	Y (BT, yellow fin RB)	VH	L	1	OPM98304	n/a	N	Y	N
2		Canoe	Y (BT)	M	L	3	OPM98304	n/a	N	N	N
3		Cariboo	Y (BT)	M	L	3	MFI?	n/a	N	N	N
4		Castle	Y (BT)	M	L	1	OPM98304	n/a	N	N	N
5		Crescent Spur	Y (BT, CH)	H	L	1	OPM98304	n/a	Y	N	N
6		Dawson	Y (BT)	M	L	1	OPM98304	n/a	Y	N	N
7		Dore	Y (BT)	M	L	1	OPM98304	n/a	Y	N	N
8		East Twin / McKale	Y (BT, CH)	H	L	1	OPM98304	n/a	N	N	N
9		Forgetmenot	Y (BT, CH)	H	L	3	MFI?	n/a	N	N	N
10		Foster	Y (BT)	M	L	1	OPM98304	n/a	N	N	N
11		Goat	Y (BT, CH, WSG)	H	L	3	MFI?	n/a	N	N	N
12		Holmes	Y (BT, CH)	VH	L	1	OPM98304	n/a	N	Y	Y
13		Horsey / Small	Y (BT)	M	L	1	OPM98304	n/a	Y	N	N
14		Hugh Allan	Y (BT)	H	L	1	OPM98304	n/a	Y	N	N
15		Kinbasket (east)	Y (BT)	M	L	1	OPM98304	n/a	Y	N	N
16		Kinbasket (west)	Y (RB, saddle lakes)	L	L	1	OPM98304	n/a	Y	N	N
17		Kiwa / Tete	Y (BT)	M	L	1	OPM98304	n/a	N	N	N

18	Robson Valley	McBride / Dunster	Y (BT, CH)	H	VH	1	OPM98304	n/a	N	Y	Y
19		Milk	Y (BT)	M	L	1	MFI?	n/a	N	N	N
20		Morkill (lower) / Cushing	Y (BT, CH)	H	L	1	MFI?	n/a	N	N	N
21		Morkill (Upper)	N	L	L	1	MFI?	n/a	N	N	N
22		Mount Robson	Y (BT, CH)	H	L	3	n/a	n/a	N	N	N
23		Raush	Y (BT)	M	L	2b	OPM98304	n/a	N	N	N
24		Trench (Northern)	Y (BT, CH)	H	L	1	MFI?	n/a	Y	N	N
25		Trench (South)	Y (BT, CH)	H	VH	1	OPM98304	n/a	Y	Y	N
26	Vanderhoof	Blackwater	Y (unique RB)	H	L	3	OPM98406	n/a	N	N	N
27		Chilako	Y (CH, CO, BB RB)	M	L	1	OPM01403	n/a	Y	N	N
28		Cluculz	Y (LT, KO, CH, BB, RT, MW)	H	L	2b	OPM01403	n/a	N	N	N
29		Endako	Y (stellako RB, SK)	VH	M	2a	OPM98408	n/a	N	N	N
30		Entiako	N	L	L	1	OPM98406	n/a	N	N	N
31		Fawnie	Y (lg DV, sustenance fish)	M	L	3	OPM98406	n/a	N	N	N
32		Greer	Y (chief grey, hobson), CH	H	M	2a	OPM98406 OPM98404	n/a	Y	N	N
33		Hallett	Y (LT, KO)	M	L	1	OPM98408	n/a	N	N	N
34		Jerryboy	N	L	L	1	OPM98406	n/a	N	N	N
35		Kluskus	Y (KO, RB)	M	L	1	OPM98406	n/a	N	N	N
36		Lucas	Y (KO, RB)	M	L	1	OPM98406 OPM98408	n/a	N	N	N
37		Nechako	Y (BMC, CH, SK, BT)	VH	VH	2a	OPM98404	n/a	N	N	N
38		Nithi	Y (stellako RB, SK, CH, BB, KO)	VH	M	1	OPM98408	n/a	N	Y	N

39	Vanderhoof	Sinkut	Y (CH)	M	M	2b	OPM98406 OPM01403	n/a	N	N	N
40		Stony	Y (RB, sustenance FN)	M	M	2a	OPA01407 OPM98406	Saik'uz FN	N	N	N
41		Stuart	Y (CH, SK)	H	L	1	OPM98404	n/a	N	N	N
42		Sutherland	Y (unique RB, SK, KO)	VH	L	5	OPM98408	n/a	N	N	N
43		Tatelkuz	Y (KO, RB)	M	L	1	OPM98406 OPM98404	n/a	N	N	N
44		Tatuk	Y (KO)	M	L	1	OPM98406	Saik'uz FN	Y	N	N
45	Fort St James	Asitka/Willow	Y (ST, SK, CO, BT)	VH	L	3	n/a	n/a	N	N	N
46		Bear lake	Y (ST, CH, SK, CO)	VH	L	2b	n/a	n/a	N	N	N
47		Beaver/Salmon	Y (CH)	M	L	1	OPM01505	n/a	Y	N	N
48		Chuchi	Y (GR, LT, RB unique)	VH	L	1	OPM98504	n/a	N	Y	Y
49		Cunningham	Y (BT, SK, LT)	H	L	5	n/a	n/a	N	N	N
50		Driftwood (Upper) / Kotsine	Y (BT, SK, CH)	H	L	1	OPM01505	n/a	N	N	N
51		Dust Creek	Y (SK)	M	L	3	OPM01505	n/a	N	N	N
52		Duti River	Y (ST, CO)	VH	L	2b	n/a	n/a	N	N	N
53		East Takla Lake	Y (BT, SK)	H	L	1	OPM01505	n/a	N	N	N
54		Fall/Silver	Y (GR, BT, DV)	VH	L	2b	OPM01505	n/a	N	N	N
55		Fort St James	N	L	L	2b	n/a	n/a	N	N	N
56		FryPan	Y (BT, KO, SK)	H	L	1	OPM01505	n/a	N	N	N
57		Grostete/Hat	Y (small lake LT, SK, CH)	H	L	1	OPM01505	n/a	N	N	N
58		Inzana	Y (LT)	M	L	1	OPM98504	n/a	Y	N	N
59		Klawli	Y (BT, RB, DV)	M	L	2b	n/a	n/a	N	N	N

60	Fort St James	Kluatantan	Y (ST, CO,SK, BT)	H	L	3	n/a	n/a	N	N	N
61		Lion / Katsberg	Y (KO, BT, SK)	H	L	1	OPM01505	n/a	Y	N	N
62		Lovell	Y (KO, BT, SK)	H	L	1	OPM01505	n/a	Y	N	N
63		Middle A	Y (KO, BT, DV, SK, CH)	VH	L	5	OPM01505 OPM98504	n/a	N	N	N
64		Middle B	Y (KO, BT, LT, DV, SK, CH)	VH	L	5	OPM01505 OPM98504	n/a	N	N	N
65		Nation (North)	Y (LT)	M	L	2b	n/a	n/a	N	N	N
66		Necoslie	N	L	L	2b	n/a	n/a	N	N	N
67		Omineca Headwaters	Y (BT, GR, DV)	M	L	3	n/a	n/a	N	N	N
68		Ominicetla	Y (GR, BT)	H	L	3	n/a	n/a	N	N	N
69		Pinchi	Y (CH, KO)	M	L	2b	OPM98504	UNBC	N	N	N
70		Sakenichie	Y (BT, KO, SK)	H	L	5	OPM01505	n/a	N	N	N
71		Salmon (North)	Y (CH)	M	L	1	OPM01505	n/a	N	N	N
72		Skeena	Y (ST, CH, SK, CO)	VH	L	3	n/a	n/a	N	N	N
73		Skeena Headwaters	Y (ST, CH, CO)	VH	L	2b	n/a	n/a	N	N	N
74		Skeena/Mosque	Y (ST, CH, SK, CO)	VH	L	2b	n/a	n/a	N	N	N
75		Skeena/Sustut	Y (ST, CH, SK, CO)	VH	L	2b	n/a	n/a	N	N	N
76		Slamgeesh	Y (CH, SK, CO)	H	L	3	n/a	n/a	N	N	N
77		Sowchea	Y (SK, KO)	M	L	2b	n/a	n/a	N	N	N
78		Squingula	Y (BT, RB, SK, CO)	VH	L	3	n/a	n/a	N	N	N
79		Stuart River	Y (SK, CH, WSG)	H	L	2b	n/a	n/a	N	N	N
80		Sustut Lake	Y (ST, SK, CH, CO)	VH	L	3	n/a	n/a	N	N	N
81		Tachie River	Y (unique RB, SK, CH)	VH	L	5	OPM00510	n/a	N	N	N

82	Fort St James	Tchentlo 25	Y (BT, LT)	H	L	2b	OPM01505	n/a	N	N	N
83		Tchentlo 27	Y (BT, LT)	H	L	1	OPM01505	n/a	N	N	N
84		Tezzeron	Y (LT)	M	L	1	OPM98508	n/a	N	N	N
85		TFL42	N	L	L	1	OPM00510	n/a	Y	N	N
86		Upper Birdflat	Y (ST, CO, BT)	VH	L	3	OPM01505	n/a	N	N	N
87		Upper Sustut	Y (ST, SK, CH, CO)	VH	L	3	n/a	n/a	N	N	N
88		Whitefish	Y (RB, LT)	M	L	5	OPM98508	n/a	N	N	N
89	Prince George	Anzac	Y (BT, GR)	VH	L	5	OPM01103	n/a	N	N	N
90		Averil	Y (CH)	M	L	1	OPM01103	n/a	N	N	N
91		Bastille	Y (BT)	M	L	3	OPM01103	n/a	N	N	N
92		Beaverly	Y (CH)	M	M	2b	OPM01103	n/a	N	N	N
93		Blackwater	Y (RB, CH)	H	L	5	OPM01103	n/a	N	N	N
94		Bowron	Y (BT, SK, CH, WSG)	VH	L	1	OPM01103	n/a	N	Y	Y
95		Captain	Y (BT, CH)	H	L	3	OPM01103	n/a	N	N	N
96		Carp	Y (RB McLeod R., BT)	H	L	5	OPM98105 OPM01103	n/a	N	N	N
97		Cottonwood	Y (CH)	M	L	1	OPM98108	n/a	N	N	N
98		Crooked	Y (RB, hart lk, BT)	M	M	1	OPM98111 OPM01103	n/a	N	N	N
99		Dome	Y (BT, CH)	H	L	1	OPM01103 OPM98105	n/a	N	N	N
100		Fontinako	Y (BT, CH)	H	L	3	OPM01103	n/a	N	N	N
101		Framstead	Y (BT, CH)	H	L	3	OPM01103	n/a	N	N	N
102		Fraser (lower)	Y (BT, CH, SK)	H	L	1	OPM01103	n/a	Y	N	N
103		Fraser (upper)	Y (BT, CH)	H	M	1	OPM01103	n/a	N	N	N

104	Prince George	Gregg	Y (CH)	M	L	2b	OPM01103	n/a	N	N	N
105		Haggen	Y (BT, pinkerton RB, CH)	H	L	4	OPM01103	n/a	N	N	N
106		Hixon	Y (CH, BT)	H	M	1	OPM98108	n/a	Y	N	N
107		Hominka	Y (GR, BT)	VH	L	5	OPM98111	n/a	N	N	N
108		Humbug	Y (BT, CH)	H	L	1	OPM01103	n/a	Y	N	N
109		James	Y (BT, CH)	H	L	3	OPM01103	n/a	N	N	N
110		Kenneth	Y (BT, CH)	H	L	1	OPM01103	n/a	Y	N	N
111		Kitchi	Y (BT)	M	L	1	OPM01103	n/a	N	N	N
112		McGregor (lower)	Y (BT, CH, WSG)	H	L	1	OPM01103	n/a	N	N	N
113		McGregor (upper)	Y (BT, hedrick RB)	M	L	1	OPM01103	n/a	N	N	N
114		McLeod	N	L	L	1	OPM98111 OPM01103	MOF	Y	N	N
115		Missinka	Y (GR, BT)	VH	L	5	OPM98111	n/a	N	N	N
116		Mud (upper)	Y (BT, CH)	H	L	2b	OPM01103	n/a	Y	N	N
117		Muskeg	N	L	L	1	OPM98109	n/a	N	N	N
118		Naver	Y (CH, BT)	H	L	1	OPM98108	n/a	Y	N	N
119		Nechako	Y (BT, CH, SK)	H	L	2b	OPM01103	n/a	N	N	N
120		Ovington	Y (BT)	M	L	3	OPM01103	n/a	N	N	N
121		Parsnip (lower)	Y (BT, GR, LT)	H	L	5	OPM98111	n/a	N	N	N
122		Parsnip (upper)	Y (BT)	H	L	5	OPM98111	n/a	N	N	N
123		Reynolds	Y (GR)	H	L	5	OPM98111	n/a	N	N	N
124		Salmon	Y (BMC, BT, CH)	H	L	2b	OPM01103	n/a	N	N	N
125		Seebach	Y (BT, CH)	H	L	1	OPM01103	n/a	N	N	N

126	Prince George	Slender	Y (KO, BMC, BT)	H	L	1	OPM98109	n/a	N	N	N
127		Slim	Y (BT, CH)	H	L	1	OPM01103	n/a	N	N	N
128		Spakwaniko	Y (BT, CH)	H	L	3	OPM01103	n/a	N	N	N
129		Stuart	Y (CH, SK, BT, WSG)	H	L	5	OPM01103	n/a	N	N	N
130		Table	Y (GR, BT)	VH	L	1	OPM98111	n/a	N	Y	Y
131		Torpy (lower)	Y (BT, CH, WSG)	VH	L	1	OPM01103	n/a	N	Y	Y
132		Torpy (upper)	Y (BT, LT, CH, WSG)	VH	L	1	OPM01103	n/a	N	Y	Y
133		Weedon	Y (BMC, CMC, LT)	H	L	1	OPM01103	n/a	N	N	N
134		Wicheeda	Y (wicheeda RB, BT)	M	L	1	OPM98111	n/a	Y	N	N
135		Willow	Y (BT, LT, KO, Eaglett Lk sustenance, CH)	VH	L	1	OPM01103 OPM98105	n/a	N	Y	Y
136	Mackenzie	Akie	Y (BT, KO)	M	L	3	n/a	n/a	N	N	N
137		Blackwater	Y (GR, BT)	H	L	1	OPM98604	n/a	N	N	N
138		Chowika	Y (BT)	VH	L	3	n/a	n/a	N	N	N
139		Clearwater	Y (GR, BT)	H	L	1	OPM01603	n/a	N	N	N
140		Collins / Lafferty	Y (BT)	M	L	1	OPM98604	n/a	N	N	N
141		Davis	Y (BT, GR)	VH	L	1	OPM98604	n/a	N	Y	N
142		Eklund	Y (BT)	M	L	1	OPM98604	n/a	N	N	N
143		Factor Ross	Y (BT)	M	L	1	OPM98604	n/a	N	N	N
144		Finlay (upper)	Y (LT, BT, GR, KO)	VH	L	3	n/a	n/a	N	N	N
145		Firesteel	Y (unique RB)	VH	L	3	n/a	n/a	N	N	N
146		Fox	Y (BT, GR)	M	L	3	n/a	n/a	N	N	N
147		Frog	Y (BT)	M	L	3	n/a	n/a	N	N	N
148		Gaffney	Y (BT)	M	L	1	OPM98604	n/a	N	N	N

149	Mackenzie	Gataga	Y (BT)	M	L	3	n/a	n/a	N	N	N
150		Germansen	Y (GR, BT)	H	L	5	OPM98604	n/a	N	N	N
151		Ingenika (lower)	Y (GR, BT)	VH	L	3	n/a	n/a	N	N	N
152		Ingenika (upper)	Y (BT, GR, DV)	VH	L	3	n/a	n/a	N	N	N
153		Kechika	Y (BT)	M	L	3	n/a	n/a	N	N	N
154		Klawli	Y (LT, BT)	M	L	5	OPM98604	n/a	N	N	N
155		Kwadacha	Y (BT)	M	L	3	n/a	n/a	N	N	N
156		Mackenzie	Y (BT, GR)	H	M	1	OPM01603	n/a	N	N	N
157		Manson	Y (KO, BT)	M	L	1	OPM98604	n/a	Y	N	N
158		McCusker	Y (BT)	M	L	3	OPM98604	n/a	N	N	N
159		McLeod	N	L	L	1	OPM98604 OPM01603	n/a	N	N	N
160		Mesilinka (lower)	Y (BT, GR)	VH	L	1	OPM01603	n/a	N	Y	Y
161		Mesilinka (upper)	Y (BT, GR)	VH	L	3	OPM01603	n/a	N	N	N
162		Misinchinka	Y (BT, GR)	VH	L	1	OPM01603	n/a	N	Y	Y
163		Nabesche	Y (BT, GR)	M	L	1	OPM01603	n/a	N	N	N
164		Nation	Y (BT, GR)	VH	L	1	OPM98604	n/a	N	Y	Y
165		Obo	Y (BT, GR)	H	L	3	n/a	n/a	N	N	N
166		Omineca	Y (BT, GR)	VH	L	2b	OPM98604 OPM01603	n/a	N	N	N
167		Osilinka (lower)	Y (BT, GR, LT)	VH	L	1	OPM01603	n/a	N	Y	Y
168		Osilinka (upper)	Y (BT, GR, LT)	VH	L	3	OPM01603	n/a	N	N	N
169		Ospika (lower)	Y (BT)	M	L	1	OPM98604	n/a	N	N	N
170		Ospika (upper)	Y (BT)	M	L	3	n/a	n/a	N	N	N
171		Paul	Y (BT)	M	L	2b	OPM98604	n/a	N	N	N

172	Mackenzie	Pelly	Y (BT)	M	L	3	n/a	n/a	N	N	N
173		Pesika	Y (BT)	M	L	3	n/a	n/a	N	N	N
174		Philip	Y (BT, GR, KO)	VH	L	1	OPM98604	n/a	N	Y	N
175		Russell	Y (BT, GR)	VH	L	1	OPM98604	n/a	N	Y	Y
176		Schooler	Y (BT, GR)	H	L	3	OPM01603	n/a	N	N	N
177		Scott	Y (BT, GR)	H	L	1	OPM01603	n/a	N	N	N
178		Scovil	N	L	L	1	OPM01603	n/a	N	N	N
179		Selwyn	Y (BT)	M	L	3	n/a	n/a	N	N	N
180		South Gataga	Y (BT)	M	L	3	n/a	n/a	N	N	N
181		Sturdee	N	L	L	2b	n/a	n/a	N	N	N
182		Swanell	Y (BT, GR)	VH	L	3	OPM01603	n/a	N	N	N
183		Thudaka	Y (BT, GR)	H	L	3	n/a	n/a	N	N	N
184		Thutade	Y (BT, DV)	H	L	2b	n/a	n/a	N	N	N
185		Tomas / Carina	Y (LT, GR, BT)	VH	L	3	n/a	n/a	N	N	N
186		Toodoggone	Y (BT, GR)	H	L	3	n/a	n/a	N	N	N
187		Tsaydiz	Y (GR, BT)	H	L	3	OPM01603	n/a	N	N	N
188		Tutiziki	Y (GR, BT)	VH	L	3	OPM01603	n/a	N	N	N
189		Upper Gataga	Y (BT)	M	L	3	n/a	n/a	N	N	N
190		Weissener	Y (BT)	M	L	3	n/a	n/a	N	N	N
191		Wicked	Y (GR, BT)	M	L	3	OPM01603	n/a	N	N	N
192	Fort St John	Aitken Creek/Blueberry River	Y (GR, CRI)	H	M	1	n/a	n/a	N	N	N
193		Big Arrow Creek	Y (GR, CRI)	H	L	3	n/a	n/a	N	N	N
194		Black Creek/Nig Creek	Y (GR)	VH	L	1	OPM01803	n/a	N	Y	Y

195	Fort St John	Boat Creek/Dehacho Creek	Y (GR)	H	L	3	n/a	n/a	N	N	N
196		Buckinghorse River	Y (BT, GR, RB)	H	L	3	n/a	n/a	N	N	N
197		Cache Creek	Y (GR)	H	M	2b	n/a	n/a	N	N	N
198		Cautley Creek/Kahntah River	Y (GR, CRI)	H	L	2b	n/a	n/a	N	N	N
199		Chinchaga River	N	M	L	3	n/a	n/a	N	N	N
200		Colt Creek	Y (BT, GR, RB)	VH	M	1	OPM01803	n/a	N	Y	Y
201		Conroy Creek	Y (GR)	H	L	3	n/a	n/a	N	N	N
202		Doig River	Y (GR)	H	M	3	n/a	n/a	N	N	N
203		Donnie Creek/Temple Creek	Y (GR)	H	L	2b	n/a	n/a	N	N	N
204		Ettithun River	Y (GR)	H	L	3	n/a	n/a	N	N	N
205		Farrell Creek	Y (GR, RB)	H	M	5	n/a	n/a	N	N	N
206		Graham-Laurier	Y (BT, RB)	VH	L	3	n/a	n/a	N	N	N
207		Graham North	Y (BT, GR, RB)	VH	L	3	n/a	n/a	N	N	N
208		Graham South	Y (BT, GR, RB)	VH	L	3	n/a	n/a	N	N	N
209		Grewatsch Creek/Holman Cr.	Y (GR, CRI)	H	L	1	n/a	n/a	N	N	N
210		Horseshoe/Bluegrave	Y (BT, GR, RB)	VH	M	5	n/a	n/a	Y	N	N
211		Jedney Creek/Beatton River	Y (GR)	H	L	2b	n/a	n/a	N	N	N
212		Katah Creek/Gutah Creek	Y (GR)	H	L	3	n/a	n/a	N	N	N
213		Keily Creek	Y (GR)	H	L	3	n/a	n/a	N	N	N
214		Kobes Creek/Groundbirch Cr.	Y (BT, GR, RB)	VH	M	1	OPM01803	n/a	N	Y	Y

215	Fort St John	Lilly Lake	Y (GR)	H	L	3	n/a	n/a	N	N	N
216		Lower Beatton/Alces River	Y (BT, GR, PDC, CRI)	VH	VH	2b	n/a	n/a	N	N	N
217		Lower Cameron River	Y (BT, GR)	H	M	2b	n/a	n/a	N	N	N
218		Lower Cypress/Halfway River	Y (BT, GR, RB)	VH	M	3	n/a	n/a	N	N	N
219		Middle Sikanni	Y (GR)	H	L	3	n/a	n/a	N	N	N
220		Middlefork Creek/Medana creek	Y (GR)	H	L	3	n/a	n/a	N	N	N
221		Milligan Creek	Y (GR)	H	M	3	n/a	n/a	N	N	N
222		Niteal Creek/Lower Kahntah R.	Y (GR)	H	L	3	n/a	n/a	N	N	N
223		Osborne River	Y (PDC)	H	L	3	n/a	n/a	N	N	N
224		Sikanni River/Fontas River	Y (GR)	H	L	3	n/a	n/a	N	N	N
225		Sikanni River/Fontas River	Y (BT, GR, RB)	H	L	3	n/a	n/a	N	N	N
226		Trimble Creek/Loranger Creek	Y (GR, RB)	H	L	3	n/a	n/a	N	N	N
227		Trutch Creek/Horse Range Cr.	Y (GR)	H	L	3	n/a	n/a	N	N	N
228		Umbach Creek	Y (GR, CRI)	H	L	2b	n/a	n/a	N	N	N
229		Upper Cameron River	Y (BT, GR)	H	M	1	n/a	n/a	N	N	N
230		Upper Chowade River	Y (BT, GR, RB)	H	L	3	n/a	n/a	N	N	N
231		Upper Cypress Creek	Y (GR, RB)	H	L	3	n/a	n/a	N	N	N
232		Upper Fontas River	Y (GR, GE)	H	L	3	n/a	n/a	N	N	N

233	Fort St John	Upper Halfway River	Y (BT, GR, RB)	VH	L	3	n/a	n/a	N	N	N
234		Upper Sikanni River	Y (GR, RB)	H	L	3	n/a	n/a	N	N	N
235	Dawson Creek	Beaudette	Y (BT, GR, RB)	H	L	3	n/a	n/a	N	N	N
236		Belcourt	Y (BT)	VH	L	3	n/a	n/a	N	N	N
237		Beryl Prarie	Y (RB)	H	M	3	n/a	n/a	N	N	N
238		Burnt River	Y (BT, GR, RB)	VH	L	1	n/a	n/a	N	Y	N
239		Carbon	Y (BT, GR, RB)	VH	L	5	OPM01703 OPM98705	n/a	N	N	N
240		Dawson Creek	Y (GR)	H	VH	3	n/a	n/a	N	N	N
241		Dunlevy	Y (BT, RB)	VH	M	3	n/a	n/a	N	N	N
242		Flatbed	Y (BT, GR, PDC, BMC)	VH	L	3	n/a	n/a	N	N	N
243		Gething	Y (BT, GR, RB)	VH	L	1	OPM01703	n/a	N	Y	Y
244		Gwillam	Y (BT, GR, RB)	VH	L	1	n/a	n/a	N	Y	N
245		Hasler	Y (BT, GR, RB)	VH	M	1	n/a	n/a	N	Y	N
246		Imperial	Y (BT)	VH	L	1	n/a	n/a	N	Y	N
247		Johnson Creek	Y (BT, GR, RB)	VH	M	5	n/a	n/a	N	N	N
248		Kinuseo	Y (BT, GR)	VH	L	3	n/a	n/a	N	N	N
249		Kiskatinaw	Y (GR, RB, CRI)	H	VH	3	n/a	n/a	N	N	N
250		Lake	Y (BT, GR, RB, CRI, PDC)	VH	H	3	n/a	n/a	N	N	N
251		Lower Moberly	Y (BT, GR)	H	M	3	n/a	n/a	N	N	N
252		Lower Murray	Y (BT, GR)	H	M	3	n/a	n/a	N	N	N
253		Lower Sukunka	Y (BT, GR, RB)	VH	M	3	n/a	n/a	N	N	N
254		Monkman	Y (BT, GR, PW, WCT)	VH	L	3	n/a	n/a	N	N	N

255	Dawson Creek	Narraway	Y (BT, RB, WCT)	VH	L	3	n/a	n/a	N	N	N
256		One Island	Y (GR, RB, FM, BT)	VH	VH	2b	n/a	n/a	N	N	N
257		Peace River	Y (BT, GR, RB)	VH	L	3	n/a	n/a	N	N	N
258		Pine Pass	Y (BT, GR, RB)	VH	M	1	OPM98705	n/a	N	Y	Y
259		Pine River	Y (BT, GR, RB, RDCxFDC)	VH	H	2b	n/a	n/a	N	N	N
260		Puggins	Y (BT, GR)	H	L	2b	n/a	n/a	N	N	N
261		Red Deer	Y (BT)	VH	L	3	n/a	n/a	N	N	N
262		Red Willow	Y (PDC, RB)	VH	L	3	n/a	n/a	N	N	N
263		Septimus	Y (BT, GR, RB)	H	L	3	n/a	n/a	N	N	N
264		Upper Moberly	Y (BT, GR, RB)	VH	H	5	OPM98705	n/a	N	N	N
265		Upper Sukunka	Y (BT, RB, GR)	VH	L	1	OPM98705	n/a	N	Y	Y
266		Wapiti	Y (BT, GR)	VH	L	3	n/a	n/a	N	N	N
267		Williston Lake	Y (BT, GR, RB)	VH	L	3	n/a	n/a	N	N	N
268		Wolverine	Y (BT, GR)	VH	L	1	OPM01703	n/a	N	Y	Y
269	Fort Nelson	Akue	Y (GR)	H	L	3	n/a	n/a	N	N	N
270		Big Beaver	Y (BT, GR)	VH	L	1	n/a	n/a	N	Y	N
271		Bunch	N	M	L	3	n/a	n/a	N	N	N
272		Capot Blanc	Y (GR)	H	L	5	n/a	n/a	N	N	N
273		Catkin	N	M	L	5	n/a	n/a	N	N	N
274		Crehan	Y (RB)	H	L	3	n/a	n/a	N	N	N
275		Crow	N	M	L	3	n/a	n/a	N	N	N
276		Crusty	Y (BT, GR)	H	L	3	n/a	n/a	N	N	N
277		D'Easum	Y (CL)	VH	L	3	n/a	n/a	N	N	N

278	Fort Nelson	Dilly	N	M	L	3	n/a	n/a	N	N	N
279		Dunedin	Y (GR, PDC)	H	L	3	n/a	n/a	N	N	N
280		Eight Mile	Y (BT, GR)	H	L	3	n/a	n/a	N	N	N
281		Ellah	Y (GR)	H	L	3	n/a	n/a	N	N	N
282		Eskai	Y (GR)	H	L	2b	n/a	n/a	N	N	N
283		Etane	N	M	L	5	n/a	n/a	N	N	N
284		Falk	Y (BT, GR)	H	L	3	n/a	n/a	N	N	N
285		Forcie	Y (BT)	H	L	3	n/a	n/a	N	N	N
286		Ft Nelson River A	Y (GR, GE)	H	L	3	n/a	n/a	N	N	N
287		FT Nelson River B	Y (GR, GE)	H	L	3	n/a	n/a	N	N	N
288		Gammer	N	M	L	3	n/a	n/a	N	N	N
289		Gatho	N	M	L	3	n/a	n/a	N	N	N
290		Graybank	Y (RW)	H	L	3	n/a	n/a	N	N	N
291		Grayling	Y (GR)	H	L	3	n/a	n/a	N	N	N
292		Hay River	N	M	L	3	n/a	n/a	N	N	N
293		Hewer	N	M	L	3	n/a	n/a	N	N	N
294		Hoffard	N	M	L	5	n/a	n/a	N	N	N
295		Holden	Y (BT, GR, PDC)	VH	L	3	n/a	n/a	N	N	N
296		Hossitl	N	M	L	3	n/a	n/a	N	N	N
297		Irene	Y (GR, PDC)	H	L	3	n/a	n/a	N	N	N
298		Jackknife	N	M	L	3	n/a	n/a	N	N	N
299		July Lake	N	M	L	3	n/a	n/a	N	N	N
300		Kiwigana	N	M	L	5	n/a	n/a	N	N	N
301		Kledo	Y (BT, GR)	VH	L	1	n/a	n/a	N	Y	N

302	Fort Nelson	Klowee	Y (BT, GR, PDC)	VH	L	3	n/a	n/a	N	N	N
303		Klua	N	H	L	1	n/a	n/a	N	N	N
304		Kwokullie	N	M	L	3	n/a	n/a	N	N	N
305		Kyklo	N	M	L	5	n/a	n/a	N	N	N
306		Labiche	N	M	L	5	n/a	n/a	N	N	N
307		Liard Hot Springs	Y (BT)	H	L	3	n/a	n/a	N	N	N
308		Liard River	Y (BT, GR, RW, IN)	VH	M	3	n/a	n/a	N	N	N
309		Liard River B	Y (BT, GR)	VH	L	3	n/a	n/a	N	N	N
310		Liard River C	Y (BT, GR, IN, RW, CM, CA)	VH	L	2b	n/a	n/a	N	N	N
311		MacDoanald	N	M	L	3	n/a	n/a	N	N	N
312		Minaker	N	M	L	3	n/a	n/a	N	N	N
313		Moose	N	M	L	3	n/a	n/a	N	N	N
314		Moule	Y (BT, GR)	H	L	3	n/a	n/a	N	N	N
315		Muncho	Y (BT, GR)	H	L	3	n/a	n/a	N	N	N
316		Muskwa River A	Y (GR, RB)	H	L	3	n/a	n/a	N	N	N
317		Muskwa River B	Y (BT, GR)	H	M	3	n/a	n/a	N	N	N
318		Ootta	N	M	L	3	n/a	n/a	N	N	N
319		Otelsas	Y (BT, GR)	H	L	3	n/a	n/a	N	N	N
320		Patry	N	M	L	5	n/a	n/a	N	N	N
321		Petitot River	N	M	L	3	n/a	n/a	N	N	N
322		Pouce	Y (GR)	H	M	2b	n/a	n/a	N	N	N
323		Prophet River	Y (BT, GR)	VH	M	3	n/a	n/a	N	N	N
324		Racing	Y (BT)	H	L	3	n/a	n/a	N	N	N
325		Ram	N	M	L	3	n/a	n/a	N	N	N

326	Fort Nelson	Redpott	N	M	L	3	n/a	n/a	N	N	N
327		Richards	N	M	L	3	n/a	n/a	N	N	N
328		Sahtaneh	N	M	L	5	n/a	n/a	N	N	N
329		Sandy	Y (GR)	H	L	3	n/a	n/a	N	N	N
330		Scatter	Y (BT, GR)	H	L	3	n/a	n/a	N	N	N
331		Shekilie	N	M	L	5	n/a	n/a	N	N	N
332		Smith	Y (BT, GR)	H	L	3	n/a	n/a	N	N	N
333		Snake	Y	H	L	2b	n/a	n/a	N	N	N
334		Stanolind	Y (GR)	H	L	2b	n/a	n/a	N	N	N
335		Sulpher	Y (BT, GR, IN)	H	L	3	n/a	n/a	N	N	N
336		Tentsi	Y (BT)	H	L	3	n/a	n/a	N	N	N
337		Tetsa	Y (GR)	H	L	3	n/a	n/a	N	N	N
338		Timberwolf	N	M	L	3	n/a	n/a	N	N	N
339		Tuchodi	Y (BT, RB)	H	L	3	n/a	n/a	N	N	N
340		Vents	Y (BT, GR)	H	L	3	n/a	n/a	N	N	N

Table A-5.3 (Table 3b) Watershed Units with Existing Projects - Prince George Forest Region

Forest District	Watershed Unit	WS #	Transition Watershed (Y/N)	Subbasins Within WU	IWAP	Overview Assessment			Prescriptions			Major Works			Effectiveness Evaluation
						Upslope (P,O,C)	Riparian (P,O,C)	In-Stream (P,O,C)	Upslope (P, O, C)	Riparian (P, O, C)	In-Stream (P, O, C)	Upslope (P, O, C)	Riparian (P, O, C)	In-Stream (P, O, C)	(P, O, C)
Robson Valley	Camp	1	N			C			C			C			
				Packsaddle		C		C	C			O			
				Kimmel crk					C						
	Canoe	2	N			C									
	Castle	4	N			C		C	C		C	C		C	
	Dawson	6	Y			C			C			C			
	Dore	7	Y		c	C			C			O			
				Boreal Crk		C			C			O			
				Middle Dore		C			C			O			
				Main Dore		C									
				South Dore		C									
	Foster	10	N												
				Windfall		C			C			C			
				Howard		C			C			C			
	Goat	11	N		c	O			O			O			
	Holmes	12	N		c	C		P	O			P			
	Horsey / Small	13	Y												
				Horsey		C		C	C		C	O		C	
				Small		C			C			C			C
	Hugh Allan	14	Y			C			C			C			

Robson Valley	Kinbasket (east)	15	Y												
				Ptarmigan		C		C	C			C			
				Dave Henry		C			C			C			
				Bulldog		C			C			C			
				A-Roads					C						
				C-Roads					C						
				U-Roads					C						
				E Canoe 36k					C						
	Kinbasket (west)	16	Y			C			C			C			
	Kiwa / Tete Jaune	17	N			C		C	C		C	C		C	
	McBride / Dunster	18	N												
				Dominion	c	C		C	O			P			
				Martinson	c	C		C	O						
	Trench (Northern)	24	Y												
				West Twin		C			C			O			
				Legrand		C			C			O			
	Trench (South)	25	Y												
				Swift crk		C		C	C			O			
				Gold crk		C			C			C			
				McLennan				C			C			C	
Vanderhoof	Blackwater	26	N												
				Naglico		C	C								
				Suscha		C	C								
				Tsacha		C	C								

Vanderhoof	Chilako	27	Y												
				Bobtail		C	C		C			C			
				Chilako		C	C		C			C			
				Gluten		C	C		C			C			
	Cluculz	28	N					C			C			C	
				Cobb		C	C								
				Hulatt		C	C								
				Lower Cluculz		C	C	C							
				Upper Cluculz		C	C			C	C		C	C	P
				Norman		C	C								
	Endako	29	N												
				Endako		C	C		P	P					
				Justine		C	C		P	P					
				Oona		C	C		P	P					
				Ormond		C	C		P	P					
				Shovel		C	C		P	P					
				Stellako		C	C		P	P					
				Stern		C	C		P	P					
				Tatlin		C	C		P	P					
	Entiako	30	N												
				Capoose		C	C								
				Van Tine		C	C								
	Fawnie	31	N												
				Cow		C	C								
				Fawnie		C	C								
				Laidman		C	C								
				Johnny		C	C								

Vanderhoof				Malaput		C	C								
				Matthew		C	C								
				Moose		C	C								
	Greer	32	Y												
				Cutoff		C	C	C							
				Lower Greer		C	C	C							
				Upper Greer		C	C	C							
				Swanson		C	C	C	C	C	C	C	O	O	P
	Halett	33	N												
				Cabin		C	C								
				Holy Cross		C	C								
				Smith	c	C	C	C	C	C	C				
				Targe		C	C								
				Tahultzu		C	C								
	Jerryboy	34	N												
				Euchinko		C	C								
				Taiuk		C	C								
	Kluskus	35	N												
				Bigbend		C	C	C	C	C	C	C	C	C	P
				Earhorn		C	C								
	Lucas	36	N												
				Cicuta		C	C								
				Lucas		C	C	C			C			C	P
				Yellow Moose		C	C								
	Nechako	37	N					C							
				Chilco		C	C								
				Clear Creek		C	C								
				Kluk		C	C								

Vanderhoof				Knight		C	C								
				Murray		C	C								
				Nine Mile		C	C								
				Trankle		C	C								
	Nithi	38	Y												
				Anzus		C	C		P	P					
				Beaumont		C	C		P	P					
				Francois		C	C		P	P					
				Nithi		C	C		P	P					
				Robertson		C	C		P	P					
	Sinkut	39	N												
				Hogsback		C	C								
				Lower Sinkut		C	C	C							
				Upper Sinkut		C	C	C							
	Stony	40	N												
				Croft		C	C								
				Corkscrew		C	C	C	C	C	C	C	C	C	P
				Engen		C	C								
				Goldie		C	C								
				Lower Stoney		C	C								
				Upper Stoney		C	C								
				Nulki	c	C	C	C			C			C	
				Rorison		C	C								
				Tatsutnai	c	C	C								
				Tachick	c	C	C	C			C			C	
	Stuart	41	N												

Vanderhoof				Bearcub		C	C		P	P					
				Breadalbane		C	C		P	P					
				Burnstead		C	C		P	P					
				Dog Creek		C	C		P	P					
				Kec Creek		C	C		P	P					
				Pitka		C	C		P	P					
	Sutherland	42	N												
				Charlotte		C	C		P	P					
				Duncan		C	C		P	P					
				Mid Sutherland		C	C		P	P					
				Upp Sutherland		C	C		P	P					
	Tatelkuz	43	N												
				Chedakuz		C	C								
				Davidson		C	C								
				Kuyakuz		C	C								
				Swollaf		C	C								
				Tatelkuz		C	C								
	Tatuk	44	Y												
				Finger		C	C	C	C	C	C	O	O		P
				Tatuk		C	C	C	C	C	C	O	O		P
				Turff		C	C								
				Willington		C	C								
Fort St James	Bear lake	46	N			P	P	P							
	Beaver/Salmon	47	Y			P	P	C			O			P	
	Chuchi	48	N			O	P	C			C	P		P	
	Cunningham	49	N			P	P	P							

Fort St James	Upp Driftwood/Kotsine	50	N					C			C			P	P
	Dust Creek	51	N			P	P	P							
	Duti River	52	N			P	P	P							
	East Takla Lake	53	N	Hudson Bay	C	O	P	C	P	P	P	P	P	P	P
	Fall/Silver	54	N				P	P	P	P	P	P	P	P	P
	Fort St James	55	N												
				Nahounli		C		C			C			C	
	FryPan	56	N	Ankwill	C	O	P	P	P	P	P	P	P	P	P
	Grostete/Hat	57	N			P	P	P	P	P	P	P	P	P	P
	Inzana	58	Y		C	O	P	C	P	P	P	P	P	P	P
	Lion / Katsberg	61	Y			O	P	C	P	P	C	P	P	O	P
	Lovell	62	Y			O	P	C	P	P	C	P	P	O	P
	Middle A	63	N			P	P	O	P	P	P	P	P	P	P
	Middle B	64	N			O	P	O	P	P	P	P	P	P	P
	Nation (North)	65	N			P	P	C	P	P	P	P	P	P	P
	Necoslie	66	N				P	P	P	P	P	P	P	P	P
	Omineca Headwaters	67	N					C							
	Pinchi	69	N			P	P	C	P	P	O	P	P	P	P
	Sakenichie	70	N			P	P	P	P	P	P	P	P	P	P
	Salmon (North)	71	N			O	P	C	P	P	O	P	P	P	P
	Sowchea	77	N			P									
	Tachie River	81	N			P	P	O	P	P	P	P	P	P	P

Fort St James	Tchentlo 25	82	N			P	P	C	P	P	P	P	P	P	P
	Tchentlo 27	83	N			O	P	C	P	P	P	P	P	P	P
	Tezzeron	84	N			O	P	P	P	P	P	P	P	P	P
	TFL42	85	Y			O	P	P	P	P	P	P	P	P	P
				Tarnezell	c	C									
	Whitefish	88	N			P	P	P	P	P	P	P	P	P	P
Prince George	Anzac	89	N			C			P						
	Averil	90	N		c	C			P						
	Bastille	91	N			C			P						
	Beaverly	92	N			P									
	Blackwater	93	N			P									
	Bowron	94	N		c	O	O	O	O	O	O	O	O	O	P
				Littlefield		C	C	C	C	C	C	C	C	C	P
				Wolverine					C						
				Bencher					C		C				
				Haggen								C			
				Beaver								C			
	Captain	95	N			C			P						
	Carp	96	N			P									
	Cottonwood	97	N			C									
	Crooked	98	N			P									
	Dome	99	N		c	C	C	C	C			C			P
	Fontinako	100	N			P									
	Framstead	101	N			P									
	Fraser (lower)	102	Y			P									
	Fraser (upper)	103	N			P									
	Gregg	104	N			P									

Prince George	Haggen	105	N			C			P						P
	Hixon	106	Y	Stone	c	C			P						P
	Hominka	107	N			C			P						P
	Humbug	108	Y			P		C	C						
	James	109	N			P									
	Kenneth	110	Y		c	P	C	C							
	Kitchi	111	N			C			P						
	McGregor (lower)	112	N		c	P									
	McGregor (upper)	113	N			C			P						
	McLeod	114	Y			C			C			P			
	Missinka	115	N			C		P	P						
	Mud (upper)	116	Y			C			P					O	
	Muskeg	117	N			P									
	Naver	118	Y			C		C	C		C	C		C	P
	Nechako	119	N			P									
	Ovington	120	N			P									
	Parsnip (lower)	121	N			P		C							
	Parsnip (upper)	122	N			C		C	P						
	Reynolds	123	N			P									
	Salmon	124	N			P									
	Seebach	125	N			C			P						
	Slender	126	N			P									
	Slim	127	N			P									
	Spakwaniko	128	N			P									

Prince George	Stuart	129	N			P									
	Table	130	N			C		C	P		O			O	
	Torpy (lower)	131	N		c	C		C	C		C	O		O	P
	Torpy (upper)	132	N		c	C		C	P		C			C	
	Weedon	133	N			P									
	Wicheeda	134	Y			C		P	O		O	O		O	P
	Willow	135	N		c	C	O	O	O	O	O	O	O	O	P
				Wansa	c			C	C						
				Tabor	c			C							
Mackenzie	Blackwater	137	N			C			C			P			
	Chowika	138	N												
				Ivor		C			C			P			
				Police		C			C			P			
	Clearwater	139	N						C			C			
				Point								C			
				Fast								C			
				Cold								C			
	Collins / Lafferty	140	N									P			
	Davis	141	Y					C							
				Davis					C	P		P			
				Shovel		C			C			P			
	Gaffney	148	N			C			C			P			
	Germansen	150	N			C			C			P			
	Ingenika (lower)	151	N			C			C			P			
	Klawli	154	N			P									
	Mackenzie	156	N			C			C						

Mackenzie	Manson	157	Y												
				Manson				C	O			P			P
				Munro					O			P			P
	McLeod	159	N												
				Reed								C			
				Lignite								C			
	Mesilinka (lower)	160	N												
				Culvert crk				P	P	P					
				Prospector		O	O	O	P	P	P	P	P	P	
				Lower Mesilinka		O	O	C	P	P	P	P	P	P	
				Control crk		O	O	O	P	P	P	P	P	P	
				Residual 1		O	O	O	P	P	P	P	P	P	
	Mesilinka (upper)	161	N												
				Tenakihi								C			
	Misinchinka	162	N			C	P	P	P	P	P	P	P	P	
	Nabesche	163	N			C	P	P	C						
	Nation	164	N			P	P	P	P	P	P	P	P	P	
	Osilinka (lower)	167	N			C		P	C			P			
	Philip	174	N			C			C			P			
	Scott	177	N			P	P	P							
	Swanell	182	N			P	P	P							
	Tsaydiz	187	N			P	P	P							
	Tutiziki	188	N			P	P	P							
Dawson Creek	Beaudette	235	N		C										

Dawson Creek	Carbon	239	Y		c			C	C		C	O		O	
	Gething	243	N		c										
	Gwillim	244	N	Meikle				C							
	Hasler	245	N		c										
				Hasler		C	C	C							
	Johnson Creek	247	N	Johnson	c		C	C			C				
				Burnt Trail	c	C									
				Maurice	c	C	C	C							
	Kiskatinaw	249	N		c							O			
	Lower Moberly	251	N		c										
	Lower Sukunka	253	Y	Martin				C	C		C	C		C	C
				Rocky				C	C			C			
				Dickebusch		C	C	C							
	One Island	256	N		c										
	Pine Pass	258	N		c										
	Pine River	259	N		c										
	Upper Moberly	264	N		c										
				Alvin							C			C	
				Moberly 39k		C			C		C	C		C	C
Fort St John	Aitken/ Blueberry	192	N		c										
	Boat/Dehacho	195	N		c										
	Buckinghorse R	196	N		c										
	Cache Creek	197	N		c										
	Cautley/Kahntah	198	N		c										

Fort St John	Colt Creek	200	Y		c	O	O	O							
				Colt	c	O	C	C	O	O	O	O	O	O	P
	Conroy Creek	201	N		c										
	Doig	202	N		c										
	Donnie/Temple	203	N		c										
	Ettithun River	204	N		c										
	Farrell Creek	205	N			C			C			C			
			N	Unnamed				C			C			C	
				Beryl-Prairie		C								C	
	Grewatsch/Holman	209	N		c										
	Horseshoe/Bluegrave	210	Y		c										
				Horseshoe	c			C			C			C	
				Blue Grave	c		C	C			C			C	
	Jedney/Beatton	211	N		c										
	Katah/Gutah	212	N		c										
	Kobes/Ground birch	214	N		c		C	C							
				Kobes W fork		C	C	C	P	P	C	P	P	O	P
	Lower Cameron	217	N		c							C			
	Low Cypress/Halfway	218	N		c										
	Middle Sikanni	219	N		c										
	Niteal/Lower Kahntah	222	N		c										

Fort St John	Sikanni/Fontas	225	N		c							C			
	Trutch/Horse Range	227	N		c										
	Umbach	228	N		c							C			
	Upper Cameron	229	N		c										
	Upper Chowade	230	N		c										
	Upper Cypress	231	N		c										
	Upper Fontas	232	N		c										
	Upper Halfway	233	N		c							C			
Fort Nelson	Crow	275	N		c										
	Irene	297	N		c										
	Muskwa River	316	N		c										
				Kledo		C			C			C		C	
	Patry	320	N	Stubby					C			C		C	
	Prophet River	323	N	Jackfish		C			C			C			
	Ram	325	N		c										
	Sandy	329	N		c										
	Scatter	330	N		c										

12.6 NON-STATUS ROAD DEACTIVATION AND REHABILITATION APPENDICES

12.7 FOREST SERVICE ROAD MANAGEMENT APPENDICES

12.8 STRENGTHENING SUSTAINABLE FOREST MANAGEMENT APPENDICES

12.8.1 STRENGTHENING SUSTAINABLE FOREST MANAGEMENT TERMS OF REFERENCE - GENERAL

12.8.1.1 BACKGROUND

Forest Renewal BC has released a new five-year strategic plan for 1999-2004, including corporate performance measures. Forest Renewal's investments are targeted to help British Columbia move towards sustainable forest management. These investments are focussed on seven strategic objectives. The ***Strengthening Strategic Forest Management*** (SSFM) strategic objective addresses the need for improved forest ecosystem knowledge, management techniques and innovations necessary to attain sustainable forest management.

During its first five years, Forest Renewal invested in knowledge aimed at operational level forest planning and management. This was necessary to implement the new policies and practices of the Forest Practices Code. Investments were primarily inventory projects, administered through the Inventory Program. The new SSFM strategic objective shifts investment focus from operations to higher-level strategic decisions and planning processes, and will require a broader range of investment activities. While inventory investments will remain part of the SSFM program, they will be redirected to strategic-level issues, planning needs and decisions.

12.8.1.2 SSFM FOCUS

Sustainable forest management (SFM) and ecosystem management are synonymous. Successful SFM requires a management approach that recognizes an integrated set of forested ecosystem variables, which in turn determine environmental, socio-economic and cultural values and forest benefits. SFM principles considers a wide range of timber and non-timber resource elements, including species and habitat diversity, soil and water conservation, forest ecosystem structure and function at the local, regional and global level, as well as the many societal benefits forests provide. SFM also considers the participatory roles and rights of forest dependent communities and First Nations.

The Forest Renewal BC SSFM objective focuses specifically on knowledge acquisition aimed at two aspects of sustainable forest management: maintenance of environmental values and resource benefits (including traditional {timber}and non-traditional forest products, and eco-tourism). Investments in improved knowledge must be at the higher levels of management planning, namely the forest or landscape levels. Investments in knowledge must therefore focus at the strategic, rather than the operational (site or stand) level of resolution, for improved SFM decision-making. SSFM investments under the 2001/2002 RMP should provide forest managers with new or improved knowledge about the impacts of alternative management practices on forest ecosystem processes, functions, values and benefits. Investment priority will favor knowledge aimed at the maintenance of environmental and resource values most at risk from forest management decisions.

12.8.1.3 PLANNING FRAMEWORK

The document *"2001-02 RMP Ground Rules"* for the Omineca-Peace Region defines the general planning framework for Resource Management Planning. Three principles underlie the SSFM planning process in the Omineca-Peace Region:

- The Planning Committee personnel, the planning process, and the final SSFM Regional RMP must have the approval and support of senior managers from both resource agencies, and Forest Renewal BC;
- The process and final plan must reflect a collaborative effort involving resources agency staff and key Forest Renewal stakeholders;
- The final, Regional SSFM Resource Management Plan must be submitted to Forest Renewal BC, Omineca-Peace Region on or before September 30, 2000, in the appropriate format and with the required content as defined in the *"Resource Management Plan for Strengthening Sustainable Forest Management (SSFM) Guidelines, May 2000"*.
- A hierarchical planning framework with specifically assigned planning roles was adopted as the best means of adhering to these planning principles. Figure 1 illustrates the three level process defined in the jointly developed Omineca-Peace RMP *Ground Rules*.

The planning roles at each level of the hierarchy are briefly described, subsequently.

12.8.1.4 RMP STEERING COMMITTEE

Level 1 of the planning hierarchy consists of a multi-agency steering committee responsible for ensuring all 10 components of the Regional RMP (including SSFM) are undertaken according to the approved planning guidelines, and within the overall planning timeframe.

Forest Renewal BC, Omineca-Peace Region; the Ministry of Forests, Prince George Region; and the Ministry of Environment, Lands and Parks, Omineca-Peace Region have each appointed representatives to serve on the RMP Steering Committee. The role of this committee in SSFM planning is ***to facilitate agency support for the SSFM Technical Planning Committee*** (see Figure A-8.1). The RMP Steering committee will recommend committee membership, monitor planning progress, and communicate committee achievements and planning resource requirements to the Regional Director of Forest Renewal, Omineca-Peace Region, the Regional Manager, Ministry of Forests, Prince George Region and the Regional Director, Ministry of Environment, Lands and Parks, Omineca-Peace Region.

The RMP Steering Committee will ensure that appropriate, collaborative input is incorporated into the SSFM plan at the regional and district planning levels, and that adequate staff support resources from both Ministry's are made available. The RMP Steering Committee will also ensure that all critical timeframes for plan completion are met.

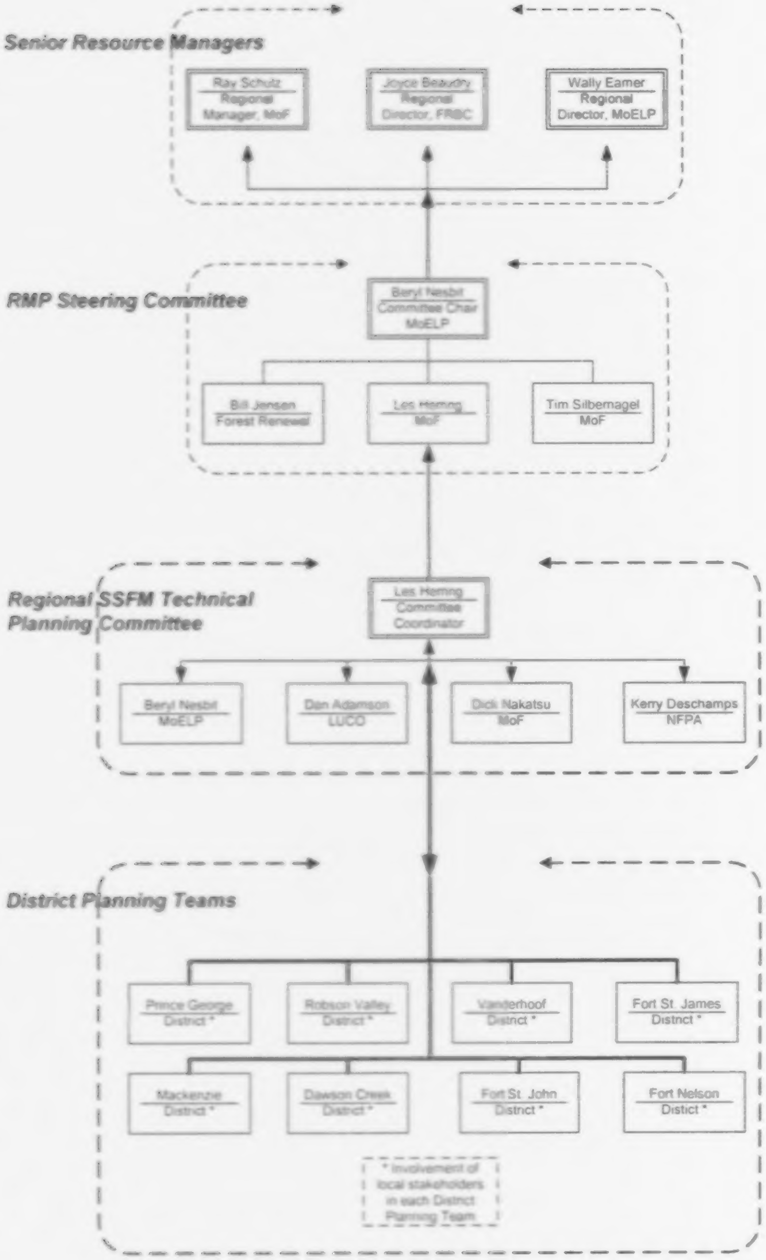

Senior Resource Managers
Ray Schulz Regional Manager, MoF
Joyce Beaudry Regional Director, FRBC
Wally Eamer Regional Director, MoELP
RMP Steering Committee
Beryl Nesbit Committee Chair MoELP
Bill Jensen Forest Renewal
Les Herring MoF
Tim Silbernagel MoF
Regional SSFM Technical Planning Committee
Les Herring Committee Coordinator
Beryl Nesbit MoELP
Dan Adamson LUCO
Dick Nakatsu MoF
Kerry Deschamps NFPA
District Planning Teams
Prince George District *
Robson Valley District *
Vanderhoof District *
Fort St. James District *
Mackenzie District *
Dawson Creek District *
Fort St. John District *
Fort Nelson Distict *
* Involvement of local stakeholders in each District Planning Team

Figure A-8.1 **The Strengthening Sustainable Forest Management Plan will be developed through a three level hierarchical planning process.**

The RMP Steering Committee membership, and the reporting relationship of each Committee member in Table A-8.1.

Table A-8.1 RMP Steering Committee Membership and Reporting Relationships.

Committee Member	Responsible to:	or Designate
Bill Jensen	Joyce Beaudry, FRBC	
Beryl Nesbit	Wally Eamer, MoELP	John Metcalfe, FWH Manager
Tim Silbernagel	Ray Schultz, MoF	Wayne Martin, Forestry Manager
Les Herring	Ray Schultz, MoF	Wayne Martin, Forestry Manager

Each member of the Committee will be responsible to the their respective Regional Director or Regional Manager, or his designate, for ensuring that all terms of the Services Agreement between Forest Renewal BC and the two agencies is fully satisfied in the plan. Reporting will be bi-monthly, or at any time senior management may be required to address planning issues arising from the SSFM Technical Planning Committee.

12.8.1.5 REGIONAL TECHNICAL PLANNING COMMITTEE

Level 2 of the SSFM planning hierarchy consists of a technical planning committee. The primary role of rhe Regional Technical Planning Committee is ***to identify and prioritize key SSFM issues, and investment project solutions, by management unit, within the Omineca/Peace Region***. The committee consists of a representative from each resource agency, the Interagency Management Committee, and the Northern Forest Products Association. The membership representation and reporting relationship of the Regional SSFM Technical Planning Committee is described in Table A-8.2.

Table A-8.2 SSFM Technical Planning Committee membership and reporting responsibility.

Committee Member	Representing	Responsible to:
Dick Nakatsu Senior Inventory Officer	MoF Prince George Forest Region	Linda Curry MoF Regional Staff Manager, Planning and LIM, Prince George Forest Region
Beryl Nesbit, FRBC Coordinator	MoELP Omineca-Peace Region	John Metcalfe MoELP Fisheries, Wildlife and Habitat Manager, Omineca-Peace Region
Dan Adamson Land Use Coordination Office, Interagency Management Committee, Program Manager	LUCO	Ray Schultz MoF Regional, MoF, Prince George Region Wally Eamer MoELP Regional Director, Omineca Peace Region
Kerry Deschamps Forest Renewal Manager, Canadian Forest Products Ltd.	Northern Forest Products Association	Doug Routledge NFPA Manager

The SSFM planning guidelines recommend the appointment of a Regional Technical Planning Committee Coordinator. Mr. Les Herring will serve in the capacity of

Coordinator. The principle role of the Coordinator is ***to provide planning support to the committee*** in the following areas:

- preparation of a detailed Terms of Reference for the Regional SSFM Technical Planning Committee;
- providing planning process orientation to members of the committee and other agency planning staff;
- preparation of draft and final plan documents;
- maintaining communication with District Planning Teams (see Figure A-8.1) to ensure local agency and stakeholder input into the Regional plan;
- preparing a planning project management plan with progress milestones and critical paths;
- assisting committee members in communication and liaison with senior agency managers, and District Planning Teams.

The Regional Technical Planning Committee will be assisted, as required, by technical advisors from each of their respective agencies. The committee coordinator will support the committee members during the planning process.

12.8.1.6 DISTRICT PLANNING TEAMS

Level 3 of the planning hierarchy consists of 8, local planning committees. Each Forest District will organize a SSFM planning team, the structure and membership of which is at the discretion of the District Manager, but must meet the intent of the *Ground Rules* regarding the involvement of key, local stakeholders.

The primary role of the District Planning Teams ***is to assist the Regional SSFM Technical Planning Committee in the identification and description of SSFM issues***. District Planning Teams, in collaboration with their local stakeholders, are best able to provide local context and priority ranking to SSFM issues of regional significance. District Planning Teams will also assist the Regional Technical Planning Committees at later phases of planning ***by reviewing and commenting on project investment solutions, as well as the draft SSFM Resource Management Plans***.

The membership of each District SSFM Planning Team has been left at the discretion of the team chair and their district management team. The following forest district officers chair the District planning teams:

Prince George District	Mr. Bob Richards; Zone Officer
Robson Valley District	Ms. Norma Stromberg-Jones; Forest Pract. Code Officer
Vanderhoof District	Mr. Norm Fallows; Watershed Restoration Technician
Fort St. James	Ms. Susan Salokannel; Zone Forester
Mackenzie	Mr. Steve Dodds; District Planner
Dawson Creek	Ms. Wynn Hays-Byl; Integrated Resource Analysis Planner
Fort St. John	Mr. Brian Farwell; Forest Renewal Silviculture Officer
Fort Nelson	Ms. Alena Terry; FRBC Forester

12.8.2 STRENGTHENING SUSTAINABLE FOREST MANAGEMENT TERMS OF REFERENCE - DETAILED

12.8.2.1 REGIONAL TECHNICAL PLANNING COMMITTEE

General Planning Activities

The *"Resource Management Plan for Strengthening Sustainable Forest Management (SSFM) Guidelines, May 2000"*SSFM emphasize the importance of appropriate Technical Planning Team membership, and a clear understanding of individual and committee responsibilities. The following general planning activities must be completed by the Regional SSFM Technical Planning Committee in order to meet all planning expectations, including required final report products and submission deadlines (see *Ground Rules* document):

In cooperation with District Planning Teams:

1. Identify and prioritize the most critical information, or knowledge-related needs and issues affecting the success of sustainable forest management in the Omineca-Peace;
2. Document the nature of these issues in the format specified in the guidelines;
3. Develop a knowledge investment strategy and rationale for each high priority issue which employs any (or all) of the following knowledge solution means:
    - Research – the investigation, discovery and application of new sustainable forest management knowledge produced through application of the scientific process.
    - Field Inventory – the collection of new, or improved ecological, vegetation, habitat and wildlife population data.
    - Extension – the identification, organization and provision to forest resource managers of existing or new sustainable forest management.
    - Decision Modeling – the development of expert systems, ecosystem and forest dynamics projection models, or other decision assisting tools which consolidate and organise existing or new sustainable forest management knowledge to assist forest managers predict SFM outcomes to management decisions.
4. Document a proposed action plan, for each investment strategy, including specific project descriptions and rationale, investment timeframe, project costs and benefits, and a monitoring strategy for evaluating the actual benefits (including performance indicators);
5. From the action plan, identify a subset of eligible Forest Renewal SSFM investment strategies and projects, as defined in the *"Resource Management Plan for Strengthening Sustainable Forest Management (SSFM) Guidelines, May 2000"* up to a total annual expenditure of $15 million.
6. Maintain regular communication and progress reporting with each team member's senior management contact.

12.8.2.2 PLANNING PHASES

The specific planning tasks required to produce the required information and RMP report are organized in a four phase planning model, adapted from the SSFM guidelines.

Planning Preparation

The planning preparation phase of regional technical planning includes the following action items (tasks other than appointment of a technical planning team appear in gant chart in Figure A-8.2):

- Appointment and familiarization of a Regional Technical Planning Team.
- Appointment of a Technical Planning Team Coordinator.
- Design and approval of a detailed Terms of Reference.
- Senior resource managers orientation orientation.

The coordinator and a committee member will schedule a meeting with the Regional Manager (MoF), Regional Director (MoELP) and Manager (NFPA) to familiarize them with the role and obligations of the Regional SSFM Technical Planning Committee. The purpose of these meetings is to seek management support and commitment to the planning process (see Table 3 for meeting assignments).

Approval, by resource agency managers, to provide technical advisory support, as required, to the Technical Planning Committee members (see Table 3 for meeting assignments).

Technical Planning Committee initial planning meeting. The purpose of this meeting is to review the terms of reference, and initiate completion of task (g), below.

Table A-8.3 Senior Management Orientation Responsibility.

Senior Managers	Tasked to: lead
Ministry of Forests R. Schultz, W. Martin, L. Currie	L. Herring, D. Nakatsu* D. Adamson
Ministry of Environment, Lands and Parks W. Eamer, J. Metcalfe, D. Zirul	L. Herring, B. Nesbit* D. Adamson
Northern Forest Products Association D. Routledge	L. Herring, K. Deschamps*, B. Jensen *

* or designated alternate

Table A-8.4 Technical specialist support, by Committee member, and agency/organization staff manager.

Committee Member (designated alternate)	Support Specialist	Discipline	Manager (section head)
D. Nakatsu (D. Maloney)	B. Schweitzer	Land Use Planning	L. Currie
	J. Pousette	Timber Supply	L. Currie
	M. Makar	Inventory	L. Currie (D. Nakatsu)
	D. Reed	Recreation	L. Currie (D. Nakatsu)
	L. Roberge	Landscape	L. Currie
	L. Badowski	G/Y	L. Currie (D. Nakatsu)
	S. Taylor	Silviculture	W. Martin
	D. Maloney	Research	W. Martin (S. Taylor)
B. Nesbit (L. Blouw)	L. Blouw	Fisheries	J. Metcalfe (D. Cadden)
	J. McInnes	Fisheries	J. Metcalfe (D. Cadden)
	B. Anderson	Fisheries	J. Metcalfe (D. Cadden)
	D. Heard	Wildlife	J. Metcalfe
	B. Arthur	Habitat	J. Metcalfe (C. Ritchie)
	A. Way	Hydrology	D. Zirul
	B. Carmichael	Water Quality	R. Girard (D. Sutherland)
D. Adamson (to be determined)	To be determined		
K. Deschamps (to be determined)	To be determined		

12.8.2.3 FRAME OF REFERENCE DEVELOPMENT.

This planning step, conducted by the Technical Planning Committee, is crucial for setting the nature and scope of potential strategic issues in the region, *and serves as a frame of reference* for District Planning Teams during local issues identification and description.

This planning step must be completed by the Technical Planning Committee, and distributed to District Planning Committees by July 31, 2000, in order to ensure sufficient time for the involvement of District Planning Committees in subsequent planning steps of the issues identification phase. It is also recommended that the Frame of Reference be submitted to senior resource agency and NFPA manager in order to solicit their direct input into the process.

12.8.2.4 ISSUES IDENTIFICATION AND RANKING

The issues identification and ranking phase involves the following step-wise planning tasks:

- Document, review and rank all district issues submissions. The deadline for district submissions is August 18, in order to prepare a summary input report
- Develop key regional issues, consistent with the Frame of Reference.
- Liaison with District Planning Teams. Reconciliation of inconsistencies between the key regional issues must begin immediately. This process will involve the coordinator and committee members (as required) in discussions with District Planning Teams.

12.8.2.5 DEVELOPING KNOWLEDGE SOLUTIONS FOR KEY ISSUES

This phase of planning begins with the development of solutions for key regional knowledge gaps, including research, field inventory, extension and decision modeling projects. Projects must be described in sufficient geographic and technical detail to serve as a strategic investment plan when summarized in the SSFM RMP.

Specific planning tasks involve the assignment of specific issues to committee members and their technical advisors, and a series of progress meetings throughout September. The planning phase ends with the completion and submission of the Regional SSFM RMP on September 29.

12.8.2.6 ORIENTATION OF RMP USERS

This phase of planning follows submission of the RMP. Briefings and orientation meetings should be scheduled for senior management and District Planning Teams, in preparation for FRBC regional investment planning in late October and November.

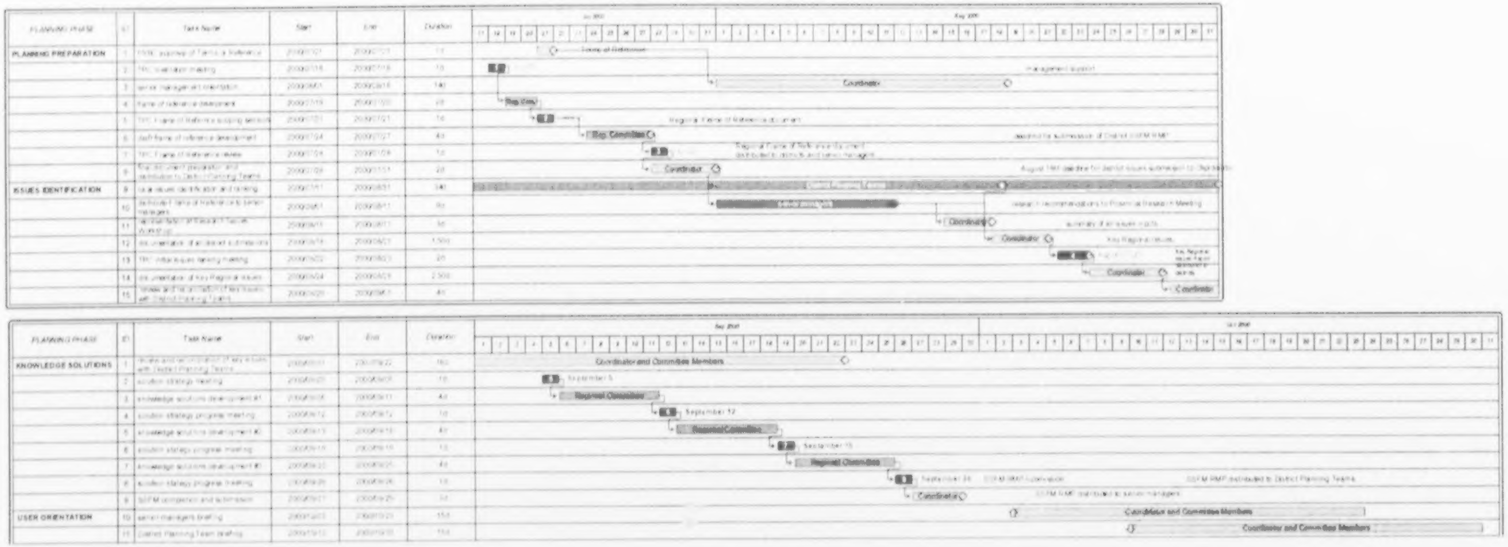
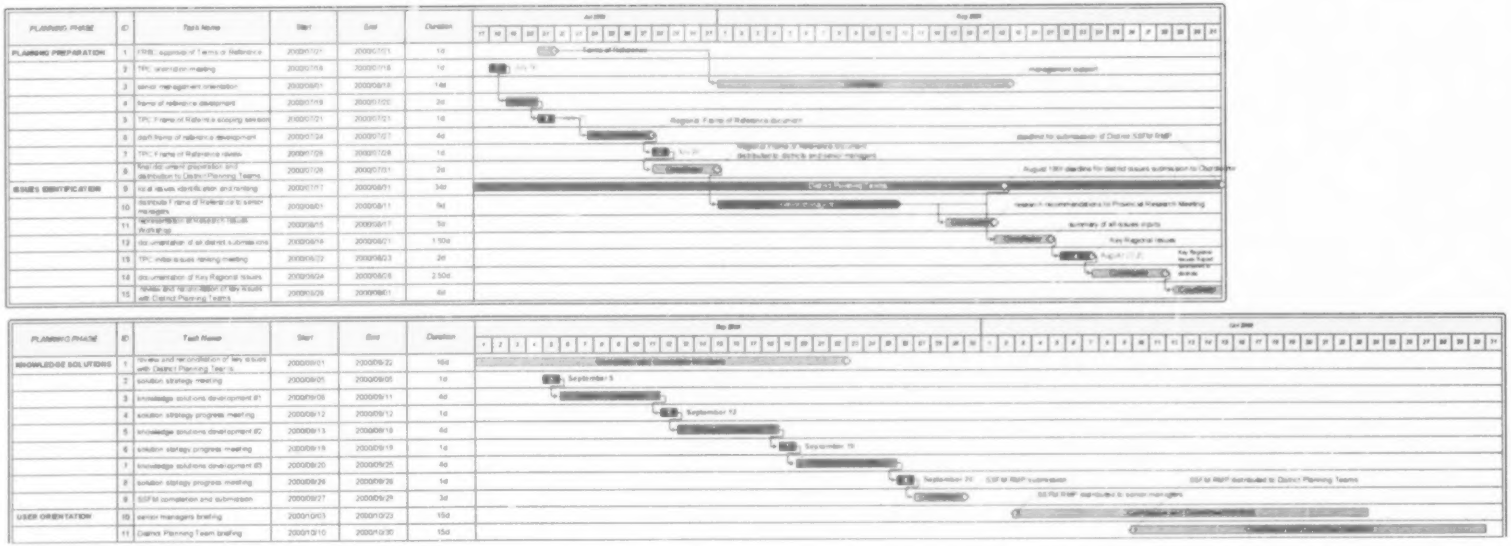


Figure A-8.2 Critical task scheduling for the Regional Technical Planning Committee for SSFM



PLANNING PHASE	ID	Task Name	Start	End	Duration
PLANNING PREPARATION	1	FRBC approval of Terms of Reference	2000/07/21	2000/07/21	1d
	2	TPC orientation meeting	2000/07/18	2000/07/18	1d
	3	senior management orientation	2000/08/01	2000/08/18	14d
	4	frame of reference development	2000/07/19	2000/07/20	2d
	5	TPC Frame of Reference scoping session	2000/07/21	2000/07/21	1d
	6	draft frame of reference development	2000/07/24	2000/07/27	4d
	7	TPC Frame of Reference review	2000/07/28	2000/07/28	1d
	8	final document preparation and distribution to District Planning Teams	2000/07/28	2000/07/31	2d
ISSUES IDENTIFICATION	9	local issues identification and ranking	2000/07/17	2000/08/31	34d
	10	distribute Frame of Reference to senior managers	2000/08/01	2000/08/11	9d
	11	representation at Research Issues Workshop	2000/08/15	2000/08/17	3d
	12	documentation of all district submissions	2000/08/18	2000/08/21	1.50d
	13	TPC initial issues ranking meeting	2000/08/22	2000/08/23	2d
	14	documentation of Key Regional issues	2000/08/24	2000/08/28	2.50d
	15	review and reconciliation of key issues with District Planning Teams	2000/08/28	2000/09/01	4d

PLANNING PHASE	ID	Task Name	Start	End	Duration
KNOWLEDGE SOLUTIONS	1	review and reconciliation of key issues with District Planning Teams	2000/09/01	2000/09/22	16d
	2	solution strategy meeting	2000/09/05	2000/09/05	1d
	3	knowledge solutions development #1	2000/09/06	2000/09/11	4d
	4	solution strategy progress meeting	2000/09/12	2000/09/12	1d
	5	knowledge solutions development #2	2000/09/13	2000/09/18	4d
	6	solution strategy progress meeting	2000/09/19	2000/09/19	1d
	7	knowledge solutions development #3	2000/09/20	2000/09/25	4d
	8	solution strategy progress meeting	2000/09/26	2000/09/26	1d
	9	SSFM completion and submission	2000/09/27	2000/09/29	3d
USER ORIENTATION	10	senior managers briefing	2000/10/03	2000/10/23	15d
	11	District Planning Team briefing	2000/10/10	2000/10/30	15d

Figure A-8.2 Critical task scheduling for the Regional Technical Planning Committee for SSFM

12.8.3 REGIONAL FRAME OF REFERENCE MATERIALS

Instruction Package
For the Prince George Forest District
SSFM Issues Submissions

Introduction

This package provides a frame of reference to assist you in identifying locally significant Sustainable Forest Management Issues and knowledge gaps. It is consistent with the procedural expectations of Forest Renewal for the preparation of the regional SSFM RMP.

The package consists of:

- an Issues Identification Summary form (page 1), which you will use to summarise each issue your district planning team wish to submit to the Regional SSFM Technical Planning Committee. Depending on the local need, your planning team will assemble and submit several (or many) individual issues, each summarised on a separate form, and ranked by their relative importance to the management unit.
- A map of the district (page 2), to use where a specific geographic will assist the regional committee in understanding the nature of an issue.
- Instructions (pages 4-7)on what information must be included in the 5 Steps of the summary form
- Examples of Issue submissions (pages 8-9).

The Frame of Reference package (Issues Identification Summary Form, map, instructions and examples) are provided in two file formats: an MS Word Template file (.dot); and an MS Word Document file (.doc). Each format has its own file entry/file management instructions (below). The choice of which format depends on the user's personal preference – the appearance, data entry conventions and final format of either version is identical. During your planning exercise you may wish to organise and prioritise your district issues on hardcopy versions of the form, but the Regional Technical Planning Committee request THAT YOUR FINAL DISTRICT SUBMISSIONS BE IN ELECTRONIC FILE FORMAT. Sketch maps for issues should be forwarded (faxed, scanned or mailed) separately to the Regional Committee.

Instructions on Managing File Formats

1. **FoRDPG.dot:** This version is a Word Template. Save it in your Word user templates directory. (To determine the location of this directory, select Tools, Options, File Locations; the directory will be listed next to the description "User templates".) To produce a document based on this template select File, New, then double-click on the FoRDPG icon. Using this template-based system, there is no danger of over-writing the original template. You are requested by the system to name and save the file by the system.
2. **FoRDPG.doc:** This is a Word Document. Save the original document in a safe location. Be sure that each document you produce uses a new copy of the document, so that you do not overwrite the original. IF YOU USE THIS FORMAT, BE SURE TO SAVE YOUR DOCUMENT UNDER A NEW FILE NAME TO PREVENT OVERWRITING THE ORIGINAL.

Instructions on Data Entry

1. Both files use data fields for entry. You must use the F11 key to move between cells in the document, rather than tabbing or using the mouse or cursor keys to reach the new location. If you forget to move to the new field properly, just click with the mouse somewhere before the last field you used, then press F11. You will be taken to the next data field.

2. The check boxes in Step 3 are also data fields. Move through the check boxes using the F11 key. When you reach the box you wish to select, just type an "X". Use the F11 key again to move through any remaining check boxes.

3. After you have reached a data field using the F11 key and have started entering data, you can use the mouse or cursor keys to move about that field and make additions or corrections. When finished with the field, press F11 to move to the next field.

4. Since your district submission will consist of several (many) individual issue summary forms, you must adopt a suitable file naming convention, to ensure that each is uniquely identified, and that files do not get overwritten. This will be easiest to manage where a single planning team member completes all data entry on behalf of the team. Where several committee members submit forms to the district planning team, we recommend that they add their initials following the district component of the file name, as well as a sequential number if they submit more than one. For example:

FoRDPGlh1.doc
FoRDPGlh2.doc
FoRDPGbn1.doc
FoRDPGdn1.doc
FoRDPGdn2.doc

Once all your planning team's files are assembled, you may wish to add another naming element to designate the relative importance ranking of each issue/knowledge need. As an alternative, ranking information may also be provided to the committee in a separate memo.

Submission Deadline

You must submit your district file package to the Co-ordinator of the Regional Technical Planning Committee by August 18, 2000, to ensure your input is considered in the RMP.

Knowledge Investments for Sustainable Forest Management

Management Unit: (TSA, TFL or Woodlot)	Stakeholder Name and Affiliation	Forest District

he forest management issue.

(What, What, and Where - SEE INSTRUCTION NOTE 1)

Describe what knowledge is required to resolve the issue.

(What, Why, When & Who - SEE INSTRUCTION NOTE 2)

List the key knowledge gap(s) and categorise their source, *(with an X)* **or the best method(s) to resolve them.**

☐ Acquire new data	☐ Analyse existing data	☐ Interpret existing information	☐ Organise and extend existing information	☐ Develop new decision tools or models	☐ Apply existing knowledge

(SEE INSTRUCTION NOTE 3)

☐ Acquire new data	☐ Analyse existing data	☐ Interpret existing information	☐ Organise and extend existing information	☐ Develop new decision tools or models	☐ Apply existing knowledge

(SEE INSTRUCTION NOTE 3)

☐ Acquire new data	☐ Analyse existing data	☐ Interpret existing information	☐ Organise and extend existing information	☐ Develop new decision tools or models	☐ Apply existing knowledge

(SEE INSTRUCTION NOTE 3)

☐ Acquire new data	☐ Analyse existing data	☐ Interpret existing information	☐ Organise and extend existing information	☐ Develop new decision tools or models	☐ Apply existing knowledge

(SEE INSTRUCTION NOTE 3)

☐ Acquire new data	☐ Analyse existing data	☐ Interpret existing information	☐ Organise and extend existing information	☐ Develop new decision tools or models	☐ Apply existing knowledge

(SEE INSTRUCTION NOTE 3)

Step 4: **Identify other forest management issue(s) which may be linked to this management issue.**

(SEE INSTRUCTION NOTE 4)

OPTIONAL – Provide, **on a separate attachment to this form**, any further information that you feel is required to fully describe the management issue, the required knowledge and the type of solution(s)

Instruction Note 1

How do I state a forest management issue?

Forest management is the art and science of controlling the spatial and temporal dynamics of the whole forest. The purpose of forest management is to modify forest dynamics, if necessary, to create or maintain a whole-forest pattern of ecosystems (terrestrial and aquatic), stands (commercial and non-commercial), conditions (macro and micro; terrestrial and aquatic), and organisms (terrestrial and aquatic) which best satisfy the objectives of the forest owner.
The goal of forest management is to select and implement the most appropriate management actions for a specific forest unit. Each forest is unique; management that is appropriate for one forest estate (woodlot; TFL; or TSA) may not be suitable in another if either management objectives or forest structure differ.

Forest management has six key elements:

1. *Forest management* ***objectives*** *are clearly expressed in measurable terms.*
2. *The forest management problem is analysed, and a solution* ***strategy*** *is designed.*
3. *Landscape, stand or ecosystem level* ***tactics*** *are designed to implement the strategy.*
4. *An operational* ***program*** *of interventions is developed to implement the appropriate tactics.*
5. *The management program is applied as a series of* ***projects*** *in the forest.*
6. *The ecosystem, stand and forest responses are evaluated and forest management* ***performance*** *is periodically reviewed and revised.*

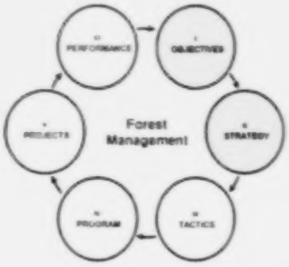


Figure A-8.3.1 Key SFM elements.

The absence of any of these key elements seriously limits the chance of forest management success. Figure A-8.3.1 is a conceptual depiction of the six key elements of forest management. The arrangement of elements is both hierarchical and circular. Management decisions in each element are made within the context of the preceding element, and subsequently provide the context for decisions made in succeeding elements, hence it represents a hierarchical decision problem. Forest management issues pertaining to the highlighted (grey) elements are the focus of Forest Renewal, although your input is welcomed on all resource issues. Please identify the key SFM element pertaining to your forest management issue.

Forest managers must consider a large set of multi-dimensional factors interacting at several scales. Figure A-8.3.2 illustrates a matrix of **some** of the possible spatial and temporal factors, and associated dimensions and scales which may determine the **forest management issue** (problem) in a forest estate. The Forest Renewal focus of the regional SSFM component of the RMP is, again, highlighted in grey (forest, regional and temporal level issues, as described in the SSFM guidelines), yet issues at higher resolutions of scale should also be considered in your input, depending on their local significance.

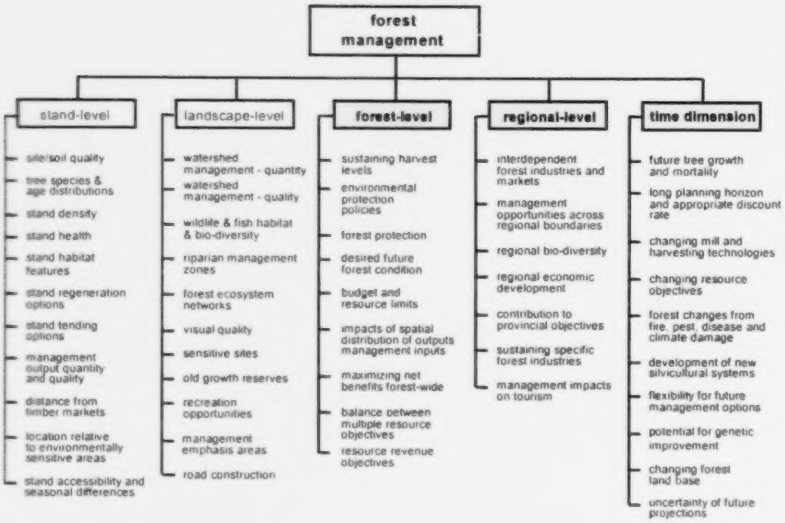

forest management
stand-level
site/soil quality
tree species & age distributions
stand density
stand health
stand habitat features
stand regeneration options
stand tending options
management output quantity and quality
distance from timber markets
location relative to environmentally sensitive areas
stand accessibility and seasonal differences
landscape-level
watershed management - quantity
watershed management - quality
wildlife & fish habitat & bio-diversity
riparian management zones
forest ecosystem networks
visual quality
sensitive sites
old growth reserves
recreation opportunities
management emphasis areas
road construction
forest-level
sustaining harvest levels
environmental protection policies
forest protection
desired future forest condition
budget and resource limits
impacts of spatial distribution of outputs management inputs
maximizing net benefits forest-wide
balance between multiple resource objectives
resource revenue objectives
regional-level
interdependent forest industries and markets
management opportunities across regional boundaries
regional bio-diversity
regional economic development
contribution to provincial objectives
sustaining specific forest industries
management impacts on tourism
time dimension
future tree growth and mortality
long planning horizon and appropriate discount rate
changing mill and harvesting technologies
changing resource objectives
forest changes from fire, pest, disease and climate damage
development of new silvicultural systems
flexibility for future management options
potential for genetic improvement
changing forest land base
uncertainty of future projections

Figure A-8.3.2 **An illustration of the five dimensions & scales which may define a forest management issue, each with many factors which could define a forest management issue in a particular forest management unit.**

How specific should I be in defining the forest management issue?

Please be as specific, or detailed as possible in describing the forest management issue. In your submission, please provide answers to the following questions:

What is the issue?

What is the forest management issue (or problem) within your forest management unit?

What key SFM element does the issue relate to?

Based on Figure 1, which of the six, key SFM elements does the issue relate to? For example, is the issue related to the absence of a clearly defined forest management objective? Does uncertainty regarding appropriate management tactics contribute to the issue? Does the issue concern the need for evaluating the biological effectiveness of current management? If the issue relates to several elements, identify them in order of their perceived importance.

Where is the management issue geographic definition of the problem?

If the management issue has a specific geographic definition (a specific landscape unit, management zone, bio-geoclimatic unit or ecosystem) in the management unit, please describe in detail and include a sketched location or boundary on the attached management unit map.

Instruction Note 2

How do I describe what knowledge is required to address the management issue I have stated in step 1?

Please be as specific, or detailed as possible, since this step must capture your local experience, expertise and perspective for the consideration of the Regional Technical Planning Committee. In your description, please ensure you answer the following specific questions:

What is the critical knowledge gap resulting in the issue?
If several information needs are evident, identify them and their priority in resolving the issue.

Why is the knowledge crucial to resolving the management issue?
What are the potential consequences for failing to address the knowledge gap?

When is the knowledge required to most effectively address the management issue?

Who is most likely to use/apply the knowledge to resolve the management issue?

Instruction Note 3

How do I list the specific knowledge gap(s) and categorise their source, or the best possible solution(s)?

The *Strengthening Strategic Forest Management* (SSFM) strategic objective addresses knowledge gaps associated with improvements and innovations in management techniques aimed at attaining sustainable forest management.

The relationship between knowledge, information and data is depicted simplistically in Figure A-8.3.3. Data is collected and analysed to create information; Information is interpreted disseminated, and used to generate knowledge; Knowledge is applied to resolve issues and problems and, hopefully, leads to wisdom, or in this case, to attainment of sustainable forest management objectives. Weaknesses or gaps at any of these steps can result in the inability to address forest management issues or problems.

In your submission you should focus specifically on the source of the knowledge gaps which prevent you from solving or resolving the forest management issue you have identified in step 1. In past years the SSFM envelope has addressed primarily natural resource inventory investments. This year you are asked to analyse the knowledge gap in order to identify the key factor(s) which limit the application of appropriate knowledge. Please distinguish between the following 6 categories of source or solution (and check the appropriate column on the form):

Acquire new data
The key knowledge gap factor is that the required resource data has either not been collected, or is currently incomplete, outdated or otherwise inadequate. New, more or better data must be collected.

Analyse existing data
The key knowledge gap factor is that the applicable resource data has already been collected, and could satisfy all or a significant portion of the required data needs. This data is, however, currently unanalysed, or is not easily available to analyse.

Interpret existing information
The key knowledge gap factor is that available information has either not been interpreted to be useful for application to the forest management issue, or is currently not being used by resource managers.

Organise and extend existing information
The key knowledge gap factor is that information pertinent to the forest management issue has not been adequately disseminated to resource managers. There is a need for improved extension services.

Develop new decision tools or models.

The key knowledge gap factor is that currently available data and information has not been integrated into an appropriate decision-support tool. There is a need to develop more, or improved decision models to support resource management decisions regarding the management issue.

Apply existing knowledge.

The key knowledge gap factor is that currently available, pertinent knowledge is not being applied to address the management issue.

Instruction Note 4

How do I identify forest management issues which may be linked to this management issue?

In many cases it may be difficult to state a single forest management issue that is totally independent of another, related issue. This is the nature of a hierarchical management structure, where linkages between problems become more complex at progressively lower levels of the hierarchy. For example, uncertainty in resource management tactics may be addressable at one level, but may be linked to uncertainty in management objectives at a higher level. Your opinions regarding linked issues will assist the Regional Technical Planning Committee in identifying key knowledge strategies.

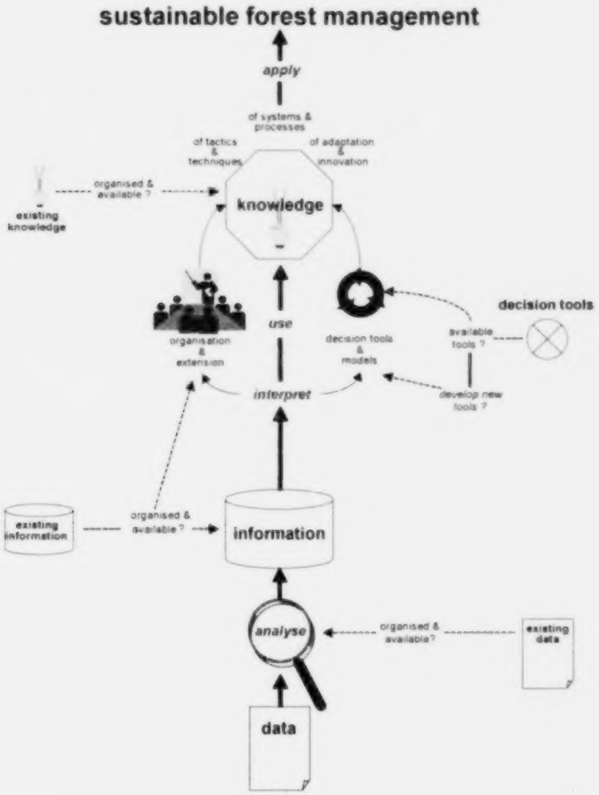

sustainable forest management
apply
of systems & processes
of tactics & techniques
of adaptation & innovation
existing knowledge
organised & available ?
knowledge
use
organisation & extension
decision tools & models
decision tools
available tools ?
develop new tools ?
interpret
existing information
organised & available ?
information
analyse
organised & available?
existing data
data

Figure A-8.3.3 A framework illustrating the relationship between data,

Table A-8.3.1 Regional Ranking of Management Unit SSFM Issue Submissions

District	Issue Keyword	Knowledge Keyword	Committee Rank
Dawson Creek	alternative harvest systems	non-timber values, timber values	36
	biodiversity	patterns, attributes	46
	complex stands	stand dynamics, yield projection, stocking standards	26
	endangered species management	red listed species, blue listed species, habitat management	41
	fish habitat, riparian habitat	habitat attributes	37
	grazing/forestry interaction, forest productivity	stocking status, grazing impact	15
	mixedwood	stand dynamics, stocking standards, yield projection	44
	planning, linkages	strategic planning, operational planning, decision tools	40
	problem forest type	utilization potential	27
	unreliable inventories	accuracy, completeness data access	50
	wildlife	grizzly bear, caribou, habitat capability	44
Fort Nelson	alternative harvest system, natural disturbance	non-timber values, timber values, stand dynamics	37
	archeological values	prediction tools	37
	biodiversity, natural disturbance	patterns, attributes	38
	caribou	suitability	50
	lakeshore protection	lake classification	20
	moose health	health attributes	3
	netdown	operability	24
		riparian	20
	understory	detection, attributes	39
	unreliable inventories	reliability, completeness, vintage	56
	vegetation management	tactics, demonstration	22
	waterfowl habitat	attributes	26
Fort St. James	access management, recreational use	caribou habitat, impacts	39
	alternative harvesting systems	riparian management zones	39
	archeological values, aboriginal values	sites, trails	40

	caribou	habitat, capability	49
	data management	fish resource data, wildlife resource data	31
	ecosystem management	attributes, spatial delineation	36
	environmental contamination, public safety	site location, hazard potential	20
	fish habitat	blue listed species	40
	high elevation	regeneration, harvesting	34
	recreation opportunities	trails, sites, lakes	35
	soil conservation	unstable terrain	34
	visual sensitivity	landscape planning	40
Fort St. John	alternative harvest systems	timber values, non-timber values	36
	biodiversity	patterns, attributes	48
	endangered species management	red listed species, blue listed species, habitat management	43
	fish habitat, riparian habitat	habitat attributes	41
	grazing/forestry interaction, forest productivity	stocking status, grazing impact	11
	linkages	decision tools, operational planning	45
	mixedwood	stand dynamics, yield projection, stocking standards	40
	soil conservation	terrain stability	28
	unreliable inventories	reliability, completeness, vintage	51
Mackenzie	biodiversity, natural disturbance	patterns, attributes	45
	complex stands	silvicultural practices, socio-economic analysis	28
	data management	resource data access, data sharing	22
	fish habitat, riparian habitat	habitat attributes	45
	growth and yield	managed stand yields, site productivity	34
	netdown	operability	20
	pests	impacts, prediction	33
	recreation	opportunities, features, values, use	31
	terrain stability, soil conservation	environmental damage	29
	traditional use, archeological values	sites, trails	38
	visual sensitivity	landscape planning	33

	wildlife	habitat use, forestry impacts	48
Prince George	biodiversity, natural disturbance	patterns, attributes	43
	cultural values, archeological values	sites, features	32
	ecosystem management	attributes, spatial delineation	32
	fish habitat	blue listed species	43
	recreation opportunities	sites, features	29
	recreational impacts	use preferences, motorized use, non-motorized use	29
	site productivity	site index, yield curves	37
	succession,natural/managed stands	attributes, dynamics, structure	40
	unreliable inventory, resource data management	completeness, accuracy, access	49
	wildlife habitat	capability, suitability	48
Robson Valley	alternate harvesting systems	habitat attributes	40
	alternative harvesting systems	non timber values, non-timber values	40
	avalanche hazard	harvesting impacts	11
	biodiversity	BEC classification	25
	flood prediction	weather attributes	12
	netdown	decay factors	20
		riparian areas	22
	pest management	marsh thistle, biological control	30
	recreational opportunities	trails	33
	recreational values	features, VQ0	36
	site productivity	site index, yield curves	37
	soil conservation	landslides	23
		terrain stability	34
	traditional use	cultural values	35
	unreliable inventory	accuracy	39
Vanderhoof	alternative harvest systems	non-timber values, harvesting impacts	36
	carbon, sink	carbon cycle	9
	caribou	habitat, capability, suitability, impacts	51
	data management	resource data, data access, data sharing	18
	fish	species, habitat, stream classification	38
	landscape unit planning	timber values, non-timber values, integrated resource management	39

	mixedwood	stand conversion, biodiversity	33
	natural disturbance, biodiversity	attributes, patterns	43
			45
	netdowns	OAF's	21
	pests	prediction, impacts	43
	problem forest types	utilization potential, merchantability, operability	20
	recreation	historic trails, cultural sites, recreational sites	33
	SFM performance measurement	attributes, indicators, criteria	39
	site productivity	site index, yield curves	37
	socio-economics	decision-tools	27
	soil conservation	terrain stability, landslides, water quality, erosion	29
	traditional use	cultural values	38
	unreliable inventories	existence, accuracy	48
	utilization	volume	26
		volume, merchantability	22
	visual sensitivity	landscape planning	35
	wildlife	grizzly bear, moose, habitat capability	44
Prince George Region	access management	resource use impacts	31
	biodiversity	old growth management areas	38
	caribou	distribution, abundance, habitat use	46
	data management, spatial	TRIM II, orthophotos	42
	fish	distribution patterns	41
	forest productivity enhancement	nutrients	16
	inventory completeness	red listed species, blue listed species	49
	species and habitat protection	riparian guidelines	35
	terrain stability	landslide prone soils	25
	water production	natural variation	28
	wildlife	otters	15
		ungulate range	38

12.8.4 MANAGEMENT UNIT CONSULTATION REPORTS

The following stakeholders collaborated on the submission of SSFM Issues to the Regional Technical Planning Committee.

12.8.4.1 PRINCE GEORGE FOREST DISTRICT

Bob Richards
Kerry Deschamps

12.8.4.2 ROBSON VALLEY FOREST DISTRICT

Norma Stromberg Jones
Marc Von Der Gonna
Bob Mitchell
Dorothy Wharton

12.8.4.3 VANDERHOOF FOREST DISTRICT

Norm Fallows
Rachael Pollard
Michelle VanSluytman
Stewart Sinclair
Ray Reilly
Joe Kavanagh
Paul Sanborn
Dave Sommerville
Greg VanDohla
Pete Vahi
Bill Laforge
Janice Thurston
Kerry Deschamps

12.8.4.4 FORT ST. JAMES FOREST DISTRICT

Susan Salokannel
Kerry Deschamps
Mike Slivitsky
Byron Goerz
D. Muddiman
Peter Valk
Diane Reed
Susan Grainger
Craig DeLong
Susan Flueck
Karl Wagner
John Marchal
Bob Baker

12.8.4.5 MACKENZIE FOREST DISTRICT

Steve Dodds
Leslie Yaremko
Shirley Gilmour

12.8.4.6 DAWSON CREEK FOREST DISTRICT

Winn Hays-Byl
Brian Pate
Rod Backmeyer
Carl Jahn
Evan Saugstad
Mike Byl

12.8.4.7 FORT ST. JOHN FOREST DISTRICT

Brian Farwell
Graham Anderson
Brendan Anderson
Dave Menzies
Scott Gordon
Janice Edwards
Mike Byl
John Dymond

12.8.4.8 FORT NELSON FOREST DISTRICT

Alena Terry
Mary Duda
Craig DeLong
Steve Duda
Steve Joyce
Steve Lindsey
Richard Kabzems
Stewart Savlin
Martin Geertsma
Myles Thorp
Mary Viszlai-Beal

Table A-12.8.4.1 Prince George District SSFM Collaboration Report.

Stakeholders	Method	Date	Response	RMP Issues Identified?	Steps for Resolution	Outstanding Issue?
Canadian Forest Products (Kerry Deschamps)	X Phone X Email X Meeting (Individual) X Meeting (group)	July 5,2000	YES	None	N/A	**NO**
Carrier Lumber Ltd. (Mike Trepanier)	X Email X Meeting (group)	July 5,2000	YES	None	N/A	**NO**
Dunkley Lumber (Doug Perdue)	X Phone X Email	July 5,2000	NO	None	N/A	**NO**
Lakeland Mills Ltd. (Mike Joles)	X Email X Meeting (group)	July 5,2000	YES	None	N/A	**NO**
Thr Pas Lumber (Dan Upward)	X Phone X Email X Meeting (group)	July 5,2000	YES	None	N/A	**NO**
Prince George Woodlot Assoc. (Brian Harding)	X Phone X Email X Meeting (group)	July 5,2000	YES	None	N/A	**NO**

Table A-12.8.4.2 **Robson Valley District SSFM Collaboration Report.**

Stakeholders	Method	Date	Response	RMP Issues Identified?	Steps for Resolution	Outstanding Issue?
Ministry of Forests Dorothy Wharton	Independent Submission	August to Sept. 2000	YES	Knowledge gaps identified from the Robson Valley LRMP, and through consultation with Marten Geerstma. No issues where solicited from licensee input, nor did licenseess review the plan.	N/A	**NO**
Ministry of Forests Norma Stromberg-Jones	X Meeting (group)	November 7 and 24. 2000	YES	Concern that MoELP issues were ranked higher than locally recommended issues.	Norma Stromberg-Jones will: contact Beryl Nesbitt at MELP to ask her how the list of SSFM issues were ranked, and thus why our priorities were ranked so low. Norma Stromberg-Jones will contact Beryl Nesbitt to get MELP input on projects as the planning table will still consider high priority projects from MELP	**NO**
Slocan Forest Products Ltd. Valemount Division Tony Bild	X Meeting (individual) X Meeting (group)	Sept. 11, 2000 November 7 and 24, 2000	YES	The planning table decided to focus on sustainable harvest and enhancing environmental values this year. The planning table also supported funding remeasurement of growth and yield permanent sample plots because the remeasurements will provide improved local data for timber supply modelling in a TSA where timber supply is declining.	N/A	**NO**
McBride Forest Industries Ltd. Craig Pryor	X Meeting (individual) X Meeting (group)	Sept. 14, 2000 November 7 and 24, 2000	YES	See above	N/A	**NO**

Hauer Bros. Lumber Ltd. Ainslie Jackman	X Meeting (individual) X Meeting (group)	Sept. 14, 2000 November 7, 2000	YES	See above	N/A	**NO**
Ministry of Forests Peter Wright	X Meeting (group)	November 7, 24, 2000	NO	See above	N/A	**NO**

Table A-12.8.4.3 **Vanderhoof District SSFM Collaboration Report.**

Stakeholders	Method	Date	Response	RMP Issues Identified?	Steps for Resolution	Outstanding Issue?
Ministry of Forests Norm Fallows	X Meeting (group)	August 1, 2000	YES	Discussed preliminary issues and means to reach consensus	N/A	**NO**
Fraser Lake Sawmills Greg VanDohla	X Meeting (group)	August 1, 2000	YES	See above	N/A	**NO**
Slocan Forest Products Ltd. Janice Thurston	X Meeting (group)	August 1, 2000	YES	See above	N/A	**NO**
Vanderhoof IFPA Bill LaForge	X Meeting (group)	August 1, 2000	YES	See above	N/A	**NO**
L&M Lumber Ltd. Peet Vahi	X Meeting (group)	August 1, 2000	YES	See above	N/A	**NO**
CanFor Ltd. Steve Jenvey	X Meeting (goup)	August 1, 2000	YES	See above	N/A	**NO**
Ministry of Forests Norm Fallows	X Meeting (group)	August 4, 2000	YES	Debate over priority SSFM issues	N/A	**NO**
Fraser Lake Sawmills Greg VanDohla	X Meeting (group)	August 4 and 7, 2000	YES	Debate over priority SSFM issues Consensus reached	N/A	**NO**
Slocan Forest Products Ltd. Janice Thurston	X Meeting (group)	August 4, 2000	YES	Debate over priority SSFM issues	N/A	**NO**
Vanderhoof IFPA Bill LaForge	X Meeting (group)	August 4 and 7, 2000	YES	Debate over priority SSFM issues Consensus reached	N/A	**NO**
Slocan Forest Products Ltd. Michelle Van Sluytman	X Meeting (group)	August 7. 2000		Consensus reached	N/A	**NO**
L&M Lumber Ltd. Peet Vahi	X Meeting (group)	August 4 and 7, 2000	YES	Debate over priority SSFM issues Consensus reached	N/A	**NO**

Table A-12.8.4.4 Fort St. James District SSFM Collaboration Report.

Stakeholders	Method	Date	Response	RMP Issues Discussed	Steps for Resolution	Outstanding Issue?
UNBC-Canfor-S. Grainger Canfor-K. Deschamps MOF Research-C. DeLong MOF- L. Herring MOF-S. Salokannel All stakeholders were invited	☐ Phone ☐ Meeting (group)	July 7	☐ YES	SSFM Overview and direction	Formulate SSFM issues	NO
				Research presentation by C. Delong		
				K. Deschamps will sit on panel to sort priorities		
MOF LIM LRMP M. Slivitzky S . Salokannel	☐ Meeting (Individual)	July 10	☐ YES	Formulate SSFM issues		NO
Tim Silbernagle MOF John McInnes Tanizul P. Valk Canfor S. Flueck MOF DJA L.Pletzer S. Salokannel	☐ Meeting (group)	July 13	☐ YES	EEV issues		NO
				Plan process and identified work areas		
S. Flueck Canfor S. Salokannel MOF	☐ Meeting (Individual)	July 13	☐ YES	SH; recreation; SSFM; FH		NO
Aboriginal Forestry Advisor B. Goerz S. Salokannel MOF	☐ Meting (Individual)	July 17	☐	SSFM issues		NO
MOF recreation K. Wagner S. Salokannel MOF	☐ ☐ Meeting (Individual) ☐	July 17	☐	Recreation issues		NO

Stuart Lake Lbr. D. Muddiman S. Salokannel MOF	☐ ☐ Meeting (Individual) ☐	July 18	☐	SH SSFM EEV		NO
Apollo Forest Products J. Marchal S. Salokannel MOF	Phone	July 18		SH, SSFM, EEV		NO
K. Deschamps Canfor S. Salokannel MOF	Phone	July 18		Using spread sheet from B. Richards		NO
Tanizul -P. Valk S. Salokannel MOF	Meeting (Individual)	July 18		Explained template for RMP submission		NO
Tanizul P. Valk	Phone Email (group)	July 20		Peter Valk submitted plan for goals and investment		NO
Canfor S. Flueck	Phone	July 26		Due to Canfor's late start with program they are having difficulty planning for next year's program		NO
Canfor S. Flueck	Phone	July 27		Canfor is too busy to provide input to RMP		NO
Stuart Lake Lumber	Meeting (Individual)	Aug. 15		SSFM - provide help in how to fill out 'issues forms'		NO
Canfor Apollo	Phone	Aug. 16	NO			NO
B. Baker SNWA	Phone Email	Aug. 16		Instructions re: template		NO
MOF, LIM, Aboriginal Affairs and SBFEP	Meeting (Individual)	Aug. 16		Explanation of criteria for SSFM		NO

Village of Fort St James Community Forest	Meeting (Individual)	Aug. 17		Explanation of criteria		NO
UNBC -Canfor	Phone	Aug. 17		Ensure input to Canfor's plan		NO
MOF, LIM, Aboriginal Affairs	Meeting (Individual)	Aug. 17		Help formulate issues		NO
Canfor	Phone Email	Aug. 17		Submitted FRBC goals & investment plan as a rough estimate.		NO
Community Forest	Phone	Aug. 18		SSFM issues		NO
B. Baker SNWA	Email	Aug. 18		How to fill out template		NO
Diane Reed MOF Rec	Meeting (Individual)	Aug. 29		Recreation opportunities spectrum		NO
Stuart Lake Lbr. -D. Muddiman	Phone	Sept. 5		Follow up on RMP input Introduced Brandon McDonald		NO
B. Goerz	Email	Sept. 6		Arch project – Level of detail?		NO

Table A-12.8.4.5 **Mackenzie District SSFM Collaboration Report.**

Stakeholders[1]	Method[2]	Date[3]	Response[4]	RMP Issues[5] Identified?	Steps for Resolution	Outstanding Issue?[6]
Donohue Forest Products Inc. (Shirley Gilmour)	☒ Phone ☒ Email ☒ Meeting (Individual) ☒ Meeting (group)	May - August	☒ YES	Clear definition of process came too late for best results. Need to establish district Resources and Inventories Committee to refine product and prioritize.	Timelines were extended and all three parties worked together to complete issue sheets. District & company executives will be considering Donohure's proposal	YES
Slocan Forest Products Ltd. Leslie Yaremko	☒ Phone ☒ Email ☒ Meeting (Individual) ☒ Meeting (group)	May - August	☒ YES	As above. Want more funding for SSFM, and consideration of taking some from backlog.	As above. SSFM funding remains unclear at this time. District RIC may help to resolve.	YES

Table A-12.8.4.6 **Dawson Creek District SSFM Collaboration Report.**

Stakeholders[1]	Method[2]	Date[3]	Response[4]	RMP Issues[5] Identified?	Steps for Resolution	Outstanding Issue?[6]
Mike Byl, Louisiana-Pacific Canada Corp.	☑ Phone ☑ Email ☐ Fax ☑ Meeting (Individual)	June 6, 2000	☑ YES ☐ NO	Stakeholder's opinions presented; no disagreement	Issues ranked by stakeholder	NO
Carl Jahn, SBFEP	☑ Phone ☑ Email ☐ Fax ☑ Meeting (Individual)	June 6, 2000	☑ YES ☐ NO	Stakeholder's opinions presented; no disagreement	Issues ranked by stakeholder	NO
Brian Pate, Chetwynd Forest Industries (West Fraser Mills)	☑ Phone ☑ Email ☑ Fax ☑ Meeting (group)	June 6, 2000	☑ YES ☐ NO	Stakeholder's opinions presented; no disagreement	Issues ranked by stakeholder	NO
Evan Saugstad, Canadian Forest Products Ltd.	☑ Phone ☑ Email ☑ Meeting (Individual)	June 6, 2000	☑ YES ☐ NO	Stakeholder's opinions presented; no disagreement	Issues ranked by stakeholder	NO
Rod Backmeyer, BC Environment	☑ Phone ☑ Email ☐ Fax ☑ Meeting (Individua) (	June 6, 2000	☑ YES ☐ NO	Stakeholder's opinions presented; no disagreement	Issues ranked by stakeholder	NO

Table A-12.8.4.7 **Fort St. John Forest District SSFM Collaboration Report.**

Stakeholders[1]	Method[2]	Date[3]	Response[4]	RMP Issues[5] Identified?	Steps for Resolution	Outstanding Issue?[6]
Dave Menzies, Canadian Forest Products, Ltd.	☐ Email ☐ Meeting (group)	Sept. 1, 2000	☐ NO	None		NO
Andrew DeVries, Canadian Forest Products, Ltd.	☐ Email ☐ Meeting (group)	Sept. 1, 2000	☐ YES	None		NO
Scott Gordon, Canadian Forest Products, Ltd.	☐ Email ☐ Meeting (group)	Sept. 1, 2000	☐ NO	None		NO
John Dymond, Slocan Forest Products Ltd.	☐ Email ☐ Meeting (group)	Sept. 1, 2000	☐ NO	None		NO
Brendan Anderson, MoELP	☐ Email Meeting (group)	Sept. 1, 2000	☐ NO	None		NO
Mike Byl, Louisiana Pacific Ltd.	☐ Email Meeting (group	Sept. 1, 2000	☐ NO	None		NO
Janice Edwards	☐ Email ☐ Meeting (Individual)	Sept. 1, 2000	☐ YES	None		NO

Table A-12.8.4.8 **Fort Nelson Forest District SSFM Collaboration Report.**

Stakeholders[1]	Method[2]	Date[3]	Response[4]	RMP Issues[5] Identified?	Steps for Resolution	Outstanding Issue?[6]
Craig DeLong, MoF	☐ Phone	Aug. 14	☐ Yes	Discussed Proposals for SSFM research	N/A	No
Martin Geertsma, MoF	☐ Meeting (Individual)	Aug. 14	☐ Yes	Discussed SSFM research proposal	N/A	No
Mary Duda, Slocan Forest Products, Ltd.	☐ Meeting (Individual)	Aug. 15	☐ Yes	Discussed SSFM versus backlog funding	N/A	No
Craig DeLong	☐ Phone	Aug. 16	☐ Yes	Submitted research proposals	N/A	NO
Richard Kabzems	☐ Meeting (Individual)	Aug. 18	☐ YES	Discussed SSFM mixedwood issues	N/A	NO
Mary Duda, Slocan Forest Products, Ltd.	☐ Fax	Aug. 20	☐ YES	Received VRI and Caribou SSFM issue proposal	N/A	NO
Steve Duda, MoF	☐ Meeting (Individual)	Aug. 25	☐ YES	Discussed VRI issue and SSFM component	N/A	NO
Myles Thorp	☐ Meeting (Individual	Aug. 28	☐ YES	Submitted for review all SSFM issues before sent to Slocan	N/A	NO
Steve Duda Mary Viszlai-Beal Steve Joyce	☐ Meeting (group)	Aug. 30	☐ YES	Submitted all proposals.	N/A	NO
Steve Lindsey Steve Joyce	☐ Meeting ☐ (group)	Sept, 6	☐ Yes	Discussed new proposals	N/A	NO
Mary Duda Myles Thorp Steve Duda Steve Lindsey Steve Joyce	☐ Meeting ☐ (group	Sept. 12	☐ Yes	Discussed priorities/ranks for SSFM issues	N/A	NO
	○		○			

12.9 FOREST RESOURCES INVENTORY APPENDICES

9. forest resources inventory

Inventory Status By Business Driver

Please turn to the next page

Prince George Forest District

Table 9.1.1 - 2 Inventory Status and Need by Business Driver

Region: Prince George District: Prince George

			Business Driver																									
			International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	Type (Intensity)	Status	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management Strategy	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	C											M	M	M		L						H					
	range cultural inventory	C									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity	B								L	L		L	L	L	L	L			L	M							
	recreation features	C								L	L		L	L	L	L	L			L	H		H	H			M	M
Terrain (Stability) Mapping	Level E/D/C reconnaisance	C								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	C								L				L	L	L		H		H			M					
	TS Field Assessment	C																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	B								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	B													H		M											
	new photo estimation	B													H	M							H			H		
	ground sampling (timber)	B													H	H	M						H			H		
	ground sampling (full VRI)	B													H										M			
Growth and Yield	productivity assessment	C													H											H		
	growth model	C													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						
Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											

Prince George Forest District

Table 9.1.1 - 2 Inventory Status with Selected Business Driver

Region: Prince George   District: Prince George

Inventory	Type (Intensity)	Status	Business Driver: International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
			Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management Strategy	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	C											M	M	M		L						H					
	range cultural inventory	C									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity	B								L	L		L	L	L	L	L			L	M							
	recreation features	C								L	L		L	L	L	L	L			L	H		H	H			M	M
Terrain (Stability) Mapping	Level E/D/C reconnaisance	C								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	C								L				L	L	L		H		H			M					
	TS Field Assessment	C																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	B								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	B													H		M											
	new photo estimation	B													H	M							H			H		
	ground sampling (timber)	B													H	H	M						H			H		
	ground sampling (full VRI)	B													H										M			
Growth and Yield	productivity assessment	C													H											H		
	growth model	C													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						
Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											

	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						
Rare Ecosystem Inventory	REI	n/a																										
BCF: Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	Intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm.w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

Robson Valley Forest District

Table 9.1.2 - 2 Inventory Status and Need by Business Driver

Region: Prince George District: Robson Valley

			Business Driver																									
			International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	**Type (intensity)**	**Status**	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features, Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		H								
Range	range ecosystem inventory	C																										
	range cultural inventory	C																										
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity									L	L		L	L	L	L	L			L	M							
	recreation features									L	L		L	L	L	L	L			L	H		H	H			M	M
Terrain (Stability) Mapping	Level E/D/C reconnaisance	C								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	C								L				L	L	L		H		H			M					
	TS Field Assessment	C																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	B								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	B													H		M											
	new photo estimation	B													H	M							H			H		
	ground sampling (timber)	B													H	H	M						H			H		
	ground sampling (full VRI)	B													H										M			
Growth and Yield	productivity assessment	C													H											H		
	growth model	C													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping°	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						
Terrestrial Ecosystem Mapping°	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						

	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						
Rare Ecosystem Inventory	REI	n/a																										
BCF Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaissance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	Intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

Robson Valley Forest District

[illegible]

Region: Prince George District: Robson Valley

Inventory	Type (Intensity)	Status	Business Driver: International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
			Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		H								
Range	range ecosystem inventory	C																										
	range cultural inventory	C																										
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity									L	L		L	L	L	L	L			L	M							
	recreation features									L	L		L	L	L	L	L			L	H		H	H			M	M
Terrain (Stability) Mapping	Level E/D/C reconnaisance	C								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	C								L				L	L	L		H		H			M					
	TS Field Assessment	C																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	B								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	B													H		M											
	new photo estimation	B													H	M							H			H		
	ground sampling (timber)	B													H	H	M						H			H		
	ground sampling (full VRI)	B													H										M			
Growth and Yield	productivity assessment	C													H											H		
	growth model	C													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						
Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						

Rare Ecosystem Inventory	REI	n/a																										
BCF: Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	Intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm.w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

Vanderhoof Forest District

Table 9.1.3 - 2 Inventory Status and Need by Business Driver

Region: Prince George District: Vanderhoof

			Business Driver																									
			International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	**Type (Intensity)**	**Status**	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features, Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	C											M	M	M		L						H					
	range cultural inventory	C									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity																											
	recreation features																											
Terrain (Stability) Mapping	Level E/D/C reconnaisance	C								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	C								L				L	L	L		H		H			M					
	TS Field Assessment	C																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	B								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	B													H		M											
	new photo estimation	B													H	M							H			H		
	ground sampling (timber)	B													H	H	M						H			H		
	ground sampling (full VRI)	B													H										M			
Growth and Yield	productivity assessment	C													H											H		
	growth model	C													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						
Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						

Rare Ecosystem Inventory	REI	n/a																										
BCF Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	Intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

Vanderhoof Forest District

Table 9.1-2: Inventory Status and Need by Business Driver

Region: Prince George District: Vanderhoof

Inventory	Type (Intensity)	Status	International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
			Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	C											M	M	M		L						H					
	range cultural inventory	C									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity																											
	recreation features																											
Terrain (Stability) Mapping	Level E/D/C reconnaisance	C								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	C								L				L	L	L		H		H			M					
	TS Field Assessment	C																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	B								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	B													H		M											
	new photo estimation	B													H	M							H			H		
	ground sampling (timber)	B													H	H	M						H			H		
	ground sampling (full VRI)	B													H										M			
Growth and Yield	productivity assessment	C													H											H		
	growth model	C													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						
Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						

Rare Ecosystem Inventory	REI	n/a																										
BCF Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	Intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm.w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

Fort St. James Forest District

Table 9.1.4 - 2 Inventory Status and Need by Business Driver

Region: Prince George District: Fort St. James

			Business Driver																									
			International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	Type (Intensity)	Status	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features, Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	C											M	M	M		L						H					
	range cultural inventory	C									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity																											
	recreation features																											
Terrain (Stability) Mapping	Level E/D/C reconnaisance	C								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	C								L				L	L	L		H		H			M					
	TS Field Assessment	C																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	B								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	B													H		M											
	new photo estimation	B													H	M							H			H		
	ground sampling (timber)	B													H	H	M						H			H		
	ground sampling (full VRI)	B													H										M			
Growth and Yield	productivity assessment	C													H											H		
	growth model	C													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping°	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						
Terrestrial Ecosystem Mapping°	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						

Rare Ecosystem Inventory	REI	n/a																										
BCF Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	Intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

Fort St. James Forest District

Table [illegible] - 2: Inventory Status and Need by Business Driver

Region: Prince George District: Fort St. James

			Business Driver																									
			International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	**Type (Intensity)**	**Status**	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features, Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	C											M	M	M		L						H					
	range cultural inventory	C									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity																											
	recreation features																											
Terrain (Stability) Mapping	Level E/D/C reconnaisance	C								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	C								L				L	L	L		H		H			M					
	TS Field Assessment	C																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	B								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	B													H		M											
	new photo estimation	B													H	M							H			H		
	ground sampling (timber)	B													H	H	M						H			H		
	ground sampling (full VRI)	B													H										M			
Growth and Yield	productivity assessment	C													H											H		
	growth model	C													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						
Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						

Rare Ecosystem Inventory	REI	n/a																										
BCF: Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	Intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm.w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

Mackenzie Forest District

Table 9.1.5 - 2: Inventory Status and Need by Business Driver

Region: _Prince George, District: Mackenzie

Inventory	Type (Intensity)	Status	Business Driver: International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
			Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	c								l	m		n/a	m	h	m	m						h		l			
	AIS	b															m						h	h	l			
Forest Health	forest health assessment	b												h	h	h							h			h		
	pest incidence surveys	b													h									h		h		
Karst	reconnaisance	n/d								l			n/a			l	l				l		l					
	planning	n/d																		l	l		l					
Range	range ecosystem inventory	c											n/a	m	l		l						m					
	range cultural inventory	c									l												m					
Recreation	visual landscape inventory	c								l			n/a	h	h	h	m			h	m		h	h			h	h
	recreation opportunity	a								l	m		n/a	m	l	m	l			l	m							
	recreation features	a								l	m		n/a	m	l	m	m			m	m		h	h			m	m
Terrain (Stability) Mapping	Level E/D/C reconnaisance	b								h	m			h	h	h		h		l			h					
(including Soils)	Level C/B/A - detailed	b								h				h	h	h		h		l			h					
	TS Field Assessment	b																m/h						h		h		
Traditional Use	TU sites	c								m	m		n/a	m	m	m							m					
Vegetation Resources Inventory	depletion update	a								h	h		n/a	h	h	h	h					h	h		h	h		
(VRI)	retrofit to VRI standards	n/d													h	h	h						h					
	new photo estimation	n/d													h	h							h			h		
	ground sampling (timber)	n/d													h	h	h						h			h		
	ground sampling (full VRI)	n/d							n/a						h	h									m			
Growth and Yield	productivity assessment	c													h											h		
	growth model	c													h											h		
Ecoregion Mapping	ecoregion interpretations	a																										
Broad Ecosystem Inventory	BEI	b							n/a	m	l	m		m	m		m											
Predictive Ecosystem Mapping°	PEM - Level 1 (overview)	c							n/a	m			n/a	m	m	m	m											
	PEM - Level 2 (detailed)	c								h			n/a	h	h	h	h					h						
Terrestrial Ecosystem Mapping°	TEM - Level R (overview)	n/a							n/a				n/a															
	TEM - Level 5 (reconnaissance)	n/a																										
	TEM - Level 4 (intensive)	n/a																										
Rare Ecosystem Inventory	REI	c										h																

Rare Ecosystem Inventory	REI	n/a																										
BCF: Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaissance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	Intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

Mackenzie Forest District

Table 9.7.5 - 2: Inventory Status and Need by Business Driver

Region _Prince George District Mackenzie

Inventory	Type (Intensity)	Status	Business Driver: International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
			Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	c								l	m		n/a	m	h	m	m						h		l			
	AIS	b															m						h	h	l			
Forest Health	forest health assessment	b												h	h	h							h			h		
	pest incidence surveys	b													h									h		h		
Karst	reconnaissance	n/d								l			n/a			l	l				l		l					
	planning	n/d																		l	l		l					
Range	range ecosystem inventory	c											n/a	m	l		l						m					
	range cultural inventory	c									l												m					
Recreation	visual landscape inventory	c								l			n/a	h	h	h	m			h	m		h	h			h	h
	recreation opportunity	a								l	m		n/a	m	l	m	l			l	m							
	recreation features	a								l	m		n/a	m	l	m	m			m	m		h	h			m	m
Terrain (Stability) Mapping (including Soils)	Level E/D/C reconnaisance	b								h	m			h	h	h		h		l			h					
	Level C/B/A - detailed	b								h				h	h	h		h		l			h					
	TS Field Assessment	b																m/h						h		h		
Traditional Use	TU sites	c								m	m		n/a	m	m	m							m					
Vegetation Resources Inventory (VRI)	depletion update	a								h	h		n/a	h	h	h	h					h	h		h	h		
	retrofit to VRI standards	n/d													h	h	h						h					
	new photo estimation	n/d													h	h							h			h		
	ground sampling (timber)	n/d													h	h	h						h			h		
	ground sampling (full VRI)	n/d							n/a						h	h									m			
Growth and Yield	productivity assessment	c													h											h		
	growth model	c													h											h		
Ecoregion Mapping	ecoregion interpretations	a																										
Broad Ecosystem Inventory	BEI	b							n/a	m	l	m		m	m		m											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	c							n/a	m			n/a	m	m	m	m											
	PEM - Level 2 (detailed)	c								h			n/a	h	h	h	h					h						
Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/a							n/a				n/a															
	TEM - Level 5 (reconnaissance)	n/a																										
	TEM - Level 4 (intensive)	n/a																										
Rare Ecosystem Inventory	REI	c										h																

BCF: Fish and Fish Habitat	summary (FISS)	c							n/a	h	h	h		h	h		l		h	h			h					
	overview (1:50,000)	c								m	m	m		m			l											
	reconnaisance (1:20,000)	c										h			h		l	h	h	h			h		h	h	h	h
	Intensive (1:5,000)	c										h						l	l	l				h			l	l
	species / population inv	c								l		l	n/a	l			l			l								
	lake classification	n/d												m			l	m	m				m	m				
Water Quality/Quantity	water quantity inventory	n/a							n/a				n/a	l														
	water use inventory (comm.w/s)	b											n/a	m	l	l	l	l					h	h			h	h
	water quality inventory	n/d											n/a	h	l	h	l	h							h			
Wildlife and Wildlife Habitat	BEI interpretations	n/d							n/a	l	l	l		l	l	l	l											
	TEM/PEM interpretations	c								m		h		h		h	h			h		h						
	species presence	b							n/a	h		h	n/a	h	h	h						h						
	species relative abundance	b										h	n/a									h						
	species absolute abundance	c																										
	rare & endangered species	c							n/a	h	h	h	n/a	h	h	h	h		h	h		h	h	h	h	h		

Dawson Creek Forest District

Table 9.1.K - 2 Inventory Status and Need by Business Driver

Region ______________ , District ______________

			Business Driver																									
			International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	Type (Intensity)	Status	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features, Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	C	L	L	H	M	L	L	H	H	H	L	H	H	M	H	H	L	L	H	H	L	H	H	M	L	H	L
	AIS	N/D	L	L	H	M	L	L	H	H	H	L	H	H	M	H	H	L	L	H	H	L	H	H	M	L	H	L
Forest Health	forest health assessment	C	L	L	L	L	L	M	L	L	L	L	L	L	H	L	L	L	L	L	L	L	H	H	L	H	L	L
	pest incidence surveys	C	L	L	L	L	L	M	L	L	L	L	L	L	H	L	L	L	L	L	L	L	H	H	L	H	L	L
Karst	reconnaisance	N/D	L	L	L	L	L	L	L	H	L	L	H	H	M	M	M	L	L	H	H	L	M	M	L	L	L	L
	planning	N/D	L	L	L	L	L	L	L	H	L	L	H	H	M	M	M	L	L	H	H	L	M	M	L	L	L	L
Range	range ecosystem inventory	C	L	L	L	L	L	L	L	M	L	L	L	H	L	H	H	L	L	L	L	L	H	H	H	M	L	L
	range cultural inventory	C	L	L	L	L	L	L	L	M	L	L	L	H	L	H	H	L	L	L	L	L	H	H	H	M	L	L
Recreation	visual landscape inventory	C	L	L	L	L	L	L	L	H	M	L	H	H	H	H	H	L	L	H	H	L	H	H	L	L	L	M
	recreation opportunity	C	L	L	L	L	L	L	L	H	M	L	H	H	L	M	H	L	L	M	M	L	M	M	L	L	L	L
	recreation features	C	L	L	L	L	L	L	L	H	M	L	H	H	M	M	H	L	L	H	H	L	M	M	L	L	L	L
Terrain (Stability) Mapping	Level E/D/C reconnaisance	B	L	L	L	L	L	L	M	L	L	L	M	M	H	M	M	L	L	L	L	L	H	H	L	L	H	H
(including Soils)	Level C/B/A - detailed	B	L	L	L	L	L	L	M	L	L	L	M	M	H	M	M	L	L	L	L	L	H	H	L	L	H	H
	TS Field Assessment	B	L	L	L	L	L	L	M	L	L	L	M	M	H	M	M	L	L	L	L	L	H	H	L	L	H	H
Traditional Use	TU sites	C	L	L	H	M	L	L	H	H	H	L	H	H	M	H	H	L	L	H	H	L	H	H	M	L	H	L
Vegetation Resources Inventory	depletion update	C	L	H	M	L	H	H	H	H	H	M	H	H	H	H	H	H	H	H	H	H	H	H	H	L	L	L
(VRI)	retrofit to VRI standards	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	new photo estimation	C	H	M	M	M	H	H	H	H	H	H	H	H	H	H	H	L	M	H	L	H	H	H	H	L	L	L
	ground sampling (timber)	C	H	M	M	M	H	H	H	H	H	M	H	M	H	H	H	L	M	H	L	M	H	H	H	L	L	L
	ground sampling (full VRI)	C	H	M	M	M	H	H	H	H	H	M	H	M	H	H	H	L	M	H	L	M	H	H	H	L	L	L
Growth and Yield	productivity assessment	C	L	L	L	L	L	M	H	L	L	L	L	M	H	M	H	L	L	L	L	L	L	L	L	L	L	L
	growth model	C	L	L	L	L	L	M	H	L	L	L	L	M	H	M	H	L	L	L	L	L	L	L	L	L	L	L
Ecoregion Mapping	ecoregion interpretations	B	H	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	M	M	M	L	L	L	L
Broad Ecosystem Inventory	BEI	C	H	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	M	M	M	L	L	L	L
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	H	H	H	L	L	L	L
	PEM - Level 2 (detailed)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	H	H	H	L	L	L	L
Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	H	H	H	L	L	L	L
	TEM - Level 5 (reconnaissance)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	H	H	H	L	L	L	L
	TEM - Level 4 (intensive)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	H	H	H	L	L	L	L
Rare Ecosystem Inventory	REI	C	L	L	L	L	L	L	L	H	L	H	M	M	M	H	H	L	L	L	L	H	H	H	L	L	L	L

BCF: Fish and Fish Habitat	summary (FISS)	c							n/a	h	h	h		h	h		l		h	h			h					
	overview (1:50,000)	c								m	m	m		m			l											
	reconnaisance (1:20,000)	c										h			h		l	h	h	h			h		h	h	h	h
	Intensive (1:5,000)	c										h						l	l	l				h			l	l
	species / population inv	c								l		l	n/a	l			l			l								
	lake classification	n/d												m			l	m	m				m	m				
Water Quality/Quantity	water quantity inventory	n/a							n/a				n/a	l														
	water use inventory (comm w/s)	b											n/a	m	l	l	l	l					h	h			h	h
	water quality inventory	n/d											n/a	h	l	h	l	h							h			
Wildlife and Wildlife Habitat	BEI interpretations	n/d							n/a	l	l	l		l	l	l	l											
	TEM/PEM interpretations	c								m		h		h		h	h			h		h						
	species presence	b							n/a	h		h	n/a	h	h	h						h						
	species relative abundance	b										h	n/a									h						
	species absolute abundance	c																										
	rare & endangered species	c							n/a	h	h	h	n/a	h	h	h	h		h	h		h	h	h	h	h		

Dawson Creek Forest District

[illegible]

Region District

			Business Driver																									
			International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	Type (Intensity)	Status	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	C	L	L	H	M	L	L	H	H	H	L	H	H	M	H	H	L	L	H	H	L	H	H	M	L	H	L
	AIS	N/D	L	L	H	M	L	L	H	H	H	L	H	H	M	H	H	L	L	H	H	L	H	H	M	L	H	L
Forest Health	forest health assessment	C	L	L	L	L	L	M	L	L	L	L	L	L	H	L	L	L	L	L	L	L	H	H	L	H	L	L
	pest incidence surveys	C	L	L	L	L	L	M	L	L	L	L	L	L	H	L	L	L	L	L	L	L	H	H	L	H	L	L
Karst	reconnaisance	N/D	L	L	L	L	L	L	L	H	L	L	H	H	M	M	M	L	L	H	H	L	M	M	L	L	L	L
	planning	N/D	L	L	L	L	L	L	L	H	L	L	H	H	M	M	M	L	L	H	H	L	M	M	L	L	L	L
Range	range ecosystem inventory	C	L	L	L	L	L	L	L	M	L	L	L	H	L	H	H	L	L	L	L	L	H	H	H	M	L	L
	range cultural inventory	C	L	L	L	L	L	L	L	M	L	L	L	H	L	H	H	L	L	L	L	L	H	H	H	M	L	L
Recreation	visual landscape inventory	C	L	L	L	L	L	L	L	H	M	L	H	H	H	H	H	L	L	H	H	L	H	H	L	L	L	M
	recreation opportunity	C	L	L	L	L	L	L	L	H	M	L	H	H	L	M	H	L	L	M	M	L	M	M	L	L	L	L
	recreation features	C	L	L	L	L	L	L	L	H	M	L	H	H	M	M	H	L	L	H	H	L	M	M	L	L	L	L
Terrain (Stability) Mapping (including Soils)	Level E/D/C reconnaisance	B	L	L	L	L	L	L	M	L	L	L	M	M	H	M	M	L	L	L	L	L	H	H	L	L	H	H
	Level C/B/A - detailed	B	L	L	L	L	L	L	M	L	L	L	M	M	H	M	M	L	L	L	L	L	H	H	L	L	H	H
	TS Field Assessment	B	L	L	L	L	L	L	M	L	L	L	M	M	H	M	M	L	L	L	L	L	H	H	L	L	H	H
Traditional Use	TU sites	C	L	L	H	M	L	L	H	H	H	L	H	H	M	H	H	L	L	H	H	L	H	H	M	L	H	L
Vegetation Resources Inventory (VRI)	depletion update	C	L	H	M	L	H	H	H	H	H	M	H	H	H	H	H	H	H	H	H	H	H	H	H	L	L	L
	retrofit to VRI standards	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	new photo estimation	C	H	M	M	M	H	H	H	H	H	H	H	H	H	H	H	L	M	H	L	H	H	H	H	L	L	L
	ground sampling (timber)	C	H	M	M	M	H	H	H	H	H	M	H	M	H	H	H	L	M	H	L	M	H	H	H	L	L	L
	ground sampling (full VRI)	C	H	M	M	M	H	H	H	H	H	M	H	M	H	H	H	L	M	H	L	M	H	H	H	L	L	L
Growth and Yield	productivity assessment	C	L	L	L	L	L	M	H	L	L	L	L	M	H	M	H	L	L	L	L	L	L	L	L	L	L	L
	growth model	C	L	L	L	L	L	M	H	L	L	L	L	M	H	M	H	L	L	L	L	L	L	L	L	L	L	L
Ecoregion Mapping	ecoregion interpretations	B	H	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	M	M	M	L	L	L	L
Broad Ecosystem Inventory	BEI	C	H	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	M	M	M	L	L	L	L
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	H	H	H	L	L	L	L
	PEM - Level 2 (detailed)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	H	H	H	L	L	L	L
Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	H	H	H	L	L	L	L
	TEM - Level 5 (reconnaissance)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	H	H	H	L	L	L	L
	TEM - Level 4 (intensive)	C	M	L	M	H	H	M	H	H	L	H	H	H	M	H	H	L	L	L	L	H	H	H	L	L	L	L
Rare Ecosystem Inventory	REI	C	L	L	L	L	L	L	L	H	L	H	M	M	M	H	H	L	L	L	L	H	H	H	L	L	L	L

BCF Fish and Fish Habitat	summary (FISS)	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	overview (1:50,000)	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	reconnaisance (1:20,000)	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	intensive (1:5,000)	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	species / population inv	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	lake classification	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
Water Quality/Quantity	water quantity inventory	C	L	L	L	L	L	M	L	M	L	L	M	H	M	H	M	H	H	L	H	L	H	H	H	L	M	H
	water use inventory (comm.w/s)	C	L	L	L	L	L	M	L	M	L	L	M	H	M	H	M	H	H	L	H	L	H	H	H	L	M	H
	water quality inventory	C	L	L	L	L	L	M	L	M	L	L	M	H	M	H	M	H	H	L	H	L	H	H	H	L	M	H
Wildlife and Wildlife Habitat	BEI interpretations	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	TEM/PEM interpretations	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	species presence	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	species relative abundance	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	species absolute abundance	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	rare & endangered species	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
Terrain Surficial Geology Mapping		C	M	M	M	L	M	L	L	H	L	H	M	H	H	L	H	L	L	L	L	H	H	M	L	L	H	H

Fort St. John Forest District

Table 9.1.7 - 2: Inventory Status and Need by Business Driver			Business Driver																									
Region: Prince George	District: Fort St. John		International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	**Type (Intensity)**	**Status**	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features, Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescritpions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	B											M	M	M		L						H					
	range cultural inventory	B									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity	C								H	M		n/a	H	L	H	H			M	M							
	recreation features	C								H	M		n/a	H	M	H	H			H	H		M	M			L	L
Terrain (Stability) Mapping	Level E/D/C reconnaisance	N/d								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	N/d								L				L	L	L		H		H			M					
	TS Field Assessment	N/d																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	C								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	C													H		M											
	new photo estimation	C													H	M							H			H		
	ground sampling (timber)	C													H	H	M						H			H		
	ground sampling (full VRI)	N/d													H										M			
Growth and Yield	productivity assessment	N/d													H											H		
	growth model	N/d													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						
Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						

BCF Fish and Fish Habitat	summary (FISS)	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	overview (1:50,000)	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	reconnaisance (1:20,000)	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	Intensive (1:5,000)	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	species / population inv	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
	lake classification	C	L	L	L	L	L	M	L	M	M	H	M	H	M	M	H	H	H	M	H	L	H	H	H	L	M	H
Water Quality/Quantity	water quantity inventory	C	L	L	L	L	L	M	L	M	L	L	M	H	M	H	M	H	H	L	H	L	H	H	H	L	M	H
	water use inventory (comm w/s)	C	L	L	L	L	L	M	L	M	L	L	M	H	M	H	M	H	H	L	H	L	H	H	H	L	M	H
	water quality inventory	C	L	L	L	L	L	M	L	M	L	L	M	H	M	H	M	H	H	L	H	L	H	H	H	L	M	H
Wildlife and Wildlife Habitat	BEI interpretations	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	TEM/PEM interpretations	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	species presence	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	species relative abundance	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	species absolute abundance	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
	rare & endangered species	C	L	L	L	L	L	M	L	M	M	H	M	H	H	H	H	M	L	H	M	H	H	H	M	L	M	H
Terrain Surficial Geology Mapping		C	M	M	M	L	M	L	L	H	L	H	M	H	H	L	H	L	L	L	L	H	H	M	L	L	H	H

Fort St. John Forest District

Table 3.1.7-2: Inventory Status and Need by Business Driver

Region: Prince George District: Fort St. John

Inventory	Type (Intensity)	Status	Business Driver																									
			International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
			Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	B											M	M	M		L						H					
	range cultural inventory	B									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity	C								H	M		n/a	H	L	H	H			M	M							
	recreation features	C								H	M		n/a	H	M	H	H			H	H		M	M			L	L
Terrain (Stability) Mapping	Level E/D/C reconnaisance	N/d								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	N/d								L				L	L	L		H		H			M					
	TS Field Assessment	N/d																H						L		L		
Traditional Use	TU sites	B								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	C								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	C													H		M											
	new photo estimation	C													H	M							H			H		
	ground sampling (timber)	C													H	H	M						H			H		
	ground sampling (full VRI)	N/d													H										M			
Growth and Yield	productivity assessment	N/d													H											H		
	growth model	N/d													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						
Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						

Rare Ecosystem Inventory	REI	n/a																										
BCF: Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	Intensive (1:5,0'00)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

Fort Nelson Forest District

Table 9.1.8 - 2 Inventory Status and Need by Business Driver			Business Driver																									
Region: Prince George District: Fort Nelson			International			National			Strategic				Regional/Sub-Regional			Local							Operational Planning Regulations					
Inventory	Type (Intensity)	Status	Convention on Biological Diversity	Kyoto Protocol	Criteria + Indicators	National Forest Strategy	Canadian Biodiversity Strategy	National Forest Inventory	Land Use Charter (CORE)	Protected Areas Strategy Process	First Nations Treaty Negotiations	Identified Wildlife Management	Regional Land Use Planning	LRMP	Timber Supply Review on TSA's	Resource Management Zones	Landscape Units	Watershed Assessments	Riparian Assessments	Sensitive Areas	Recreation Features Sites	Ungulate Winter Ranges	Forest Development Plans	Silviculture Prescriptions	Range Use Plans	Stand Management Prescriptions	Road Design Regulations	Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaisance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	C											M	M	M		L						H					
	range cultural inventory	C									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity	C								H	M		n/a	L	M	L	H			M	M							
	recreation features	C								H	M		n/a	L	M	L	H			H	H		H	H			L	L
Terrain (Stability) Mapping	Level E/D/C reconnaisance	N/d								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	N/d								L				L	L	L		H		H			M					
	TS Field Assessment	N/d																H						L		L		
Traditional Use	TU sites	C								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	C								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	N/d													H		M											
	new photo estimation	N/d													H	M							H			H		
	ground sampling (timber)	N/d													H	H	M						H			H		
	ground sampling (full VRI)	N/d													H										M			
Growth and Yield	productivity assessment	N/d													H											H		
	growth model	N/d													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						
Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						

Rare Ecosystem Inventory	REI	n/a																										
BCF Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	Intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

Fort Nelson Forest District

Table 9.1.8.1.2 Inventory Status and Needs by Business Driver

Region: Prince George District: Fort Nelson

Inventory	Type (Intensity)	Status	International: Convention on Biological Diversity	International: Kyoto Protocol	International: Criteria + Indicators	National: National Forest Strategy	National: Canadian Biodiversity Strategy	National: National Forest Inventory	Strategic: Land Use Charter (CORE)	Strategic: Protected Areas Strategy Process	Strategic: First Nations Treaty Negotiations	Strategic: Identified Wildlife Management	Regional/Sub-Regional: Regional Land Use Planning	Regional/Sub-Regional: LRMP	Regional/Sub-Regional: Timber Supply Review on TSA's	Local: Resource Management Zones	Local: Landscape Units	Local: Watershed Assessments	Local: Riparian Assessments	Local: Sensitive Areas	Local: Recreation Features Sites	Local: Ungulate Winter Ranges	Operational Planning Regulations: Forest Development Plans	Operational Planning Regulations: Silviculture Prescriptions	Operational Planning Regulations: Range Use Plans	Operational Planning Regulations: Stand Management Prescriptions	Operational Planning Regulations: Road Design Regulations	Operational Planning Regulations: Harvesting Regulations
Archaeology	AOA	B								L	H		H	H		M							H	H		M	M	M
	AIS	B																					H	H		M	M	M
Forest Health	forest health assessment	C												L	H	H							H			H		
	pest incidence surveys	C													H									H		H		
Karst	reconnaissance	n/d								L			M			L	L				M							
	planning	C																		M								
Range	range ecosystem inventory	C											M	M	M		L						H					
	range cultural inventory	C									L												M					
Recreation	visual landscape inventory	C								H			n/a	H	H	H	H			H	M		H	H			H	M
	recreation opportunity	C								H	M		n/a	L	M	L	H			M	M							
	recreation features	C								H	M		n/a	L	M	L	H			H	H		H	H			L	L
Terrain (Stability) Mapping	Level E/D/C reconnaisance	N/d								M	L			L	L	L		H		H			M					
(including Soils)	Level C/B/A - detailed	N/d								L				L	L	L		H		H			M					
	TS Field Assessment	N/d																H						L		L		
Traditional Use	TU sites	C								M	H		H	H	H	L							L					
Vegetation Resources Inventory	depletion update	C								L	L		M	H	H	L	H					H	H		M	M		
(VRI)	retrofit to VRI standards	N/d													H		M											
	new photo estimation	N/d													H	M							H			H		
	ground sampling (timber)	N/d													H	H	M						H			H		
	ground sampling (full VRI)	N/d													H										M			
Growth and Yield	productivity assessment	N/d													H											H		
	growth model	N/d													H											H		
Ecoregion Mapping	ecoregion interpretations	C																										
Broad Ecosystem Inventory	BEI	C								H	M	H		H	M		H											
Predictive Ecosystem Mapping*	PEM - Level 1 (overview)	B								L			M	M	M		H											
	PEM - Level 2 (detailed)	n/d								L			L	M	M		H					H						
Terrestrial Ecosystem Mapping*	TEM - Level R (overview)	n/d											L	L			L											
	TEM - Level 5 (reconnaissance)	C																										
	TEM - Level 4 (intensive)	n/d										L										L						

Rare Ecosystem Inventory	REI	n/a																										
BCF: Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

Rare Ecosystem Inventory	REI	n/a																										
BCF: Fish and Fish Habitat	summary (FISS)	C								H	M	H		H	H		H		H	L			H					
	overview (1:50,000)	C								H	M	H		H			H											
	reconnaisance (1:20,000)	C										H			H		H	M	H	L			H		L	M	H	H
	Intensive (1:5,000)	n/d										L						M	H	L				H			H	H
	species / population inv	n/d								H		M	M	H			H			L								
	lake classification	n/d												H			H	M	H				H	H				
Water Quality/Quantity	water quantity inventory	B											M	M		M	M										H	H
	water use inventory (comm w/s)	B											M	M	L	M	M	H					H	H			H	H
	water quality inventory	B											M	M	L	L	M	H							H			
Wildlife and Wildlife Habitat	BEI interpretations	C								H	M	H		H	H	H	H											
	TEM/PEM interpretations	C								H		H		H		H	H			H		H						
	species presence	C								H		H	H	H	H	H						H						
	species relative abundance	C										H	H									H						
	species absolute abundance	C																										
	rare & endangered species	n/d								H	L	H	H	H	M	H	H		M	L		H	H	H	H	H		

Regional Assessment of Inventory Status for Management Units

Forest Health

Forest Health inventories throughout the region are either unavailable, incomplete, or must be upgraded frequently due the dynamic nature of the pest species being inventories. This is particularly the case concerning the four species of bark beetle, and two year spruce budworm, all of which are at epidemic levels at various locations in the region (see Section 4).

Managed stand forest health inventory status is also inadequate, especially concerning decision support data for managing !odgepole pine stands infected by any of the three species of stem rust. Stem rust hazard maps are feasible, relatively inexpensive inventory products that are needed within all three SubBoreal TSA's in the region.

Hazard maps of several root rot pathogens (*Inonotus tomentosis*, and *Armillaria ostoyae*) species is an potentially important management support Work has been limited due to lack of fund, and is focussed within only two Forest Districts.

visual Landscape Inventories

The Poor Status rating of the visual landscape inventory component (see Table 9..2.2) for all the forest districts is a reflection of a lack of or outdated field inventory mapping for a large portion of the visually sensitive/scenic areas identified in these districts.

Without accurate and reliable visual landscape inventories, it is difficult to determine societal values and objectives and have proper input into many of the business drivers identified previously in Tables 9.1.1 to 8. For example, uncertainties related to unrefined and outdated visual landscape inventories make the LRMP recommendations of identifying, managing, and protecting the integrity of important viewscapes for commercial and non-commercial recreation, making scenic areas known, and establishing VQOs difficult.

This knowledge gap not only impacts timber supply and the implementation of the LRMP recommendations, but render operational planning difficult with the risk of creating adverse visual impacts and negatively affecting visual, recreation and tourism values in the short-term.

To address this issue, detailed Visual Landscape Inventories would provide the improved knowledge base necessary to implement the LRMP recommendations and increase certainty about the effects of strategic decisions on timber supply (TSR3). In addition, detailed up-to-date VLIs would better meet Forest Certification principles.

The following table provides the number and cost estimate for carrying out new and updating old visual landscape inventories to the new standards in each district for the next three years.

Table 9.2.1 Overall Cost Estimate for Completing New/Updating Old Visual Inventories.

Forest District	Number of Scenic Areas requiring inventory update in the next 3 years	Cost Estimate ($)
Dawson Creek	10	124,000
Fort Nelson	3	85,000
Fort St. James	11	125,000
Fort St. John	3	80,000
Mackenzie	10	130,000
Prince George	16	250,000
Robson Valley	12	206,000
Vanderhoof	12	200,000
Grand Total	80	$ 1,200,000

Recreation Opportunities and Features Inventories

Management unit LRMP's specify the following management direction for developing recreation and tourism opportunities:

- Creatr more recreation trails and sites in response to demand where compatible with other uses.
- Discourage the impacts from recreationalists on the environment
- Develop management plans that reduce conflicts between recreation users.
- Identify and classify lakes for recreation, in consultation with the public.
- Consider roaded recreation in access management planning .

Despite this direction, there is considerable risk that these non-timber resources will not be adequately managed in several Forest Districts due the inadequate or incomplete state of recreational inventories. Specifically, uncertainties related to outdated Recreation Opportunity Spectrum (ROS) inventories, and Recreation Feature Inventories (RFI), make it, or impossible to implement LRMP and higher level recreation.

This forest level issue involves the balancing of multiple resource objectives. Inventory data, together with user survey data, is the basic information required to ensure the sought for balance.. Once analysed, a management strategy can be designed to conserve and protect key resources, and fulfill recreation management objectives

The ROS and RFI for the Prince George, Dawson Creek, Fort Nelson Forest Districts have not been updated since1994. Using these outdated inventories risks not adequately accounting for features that have been identified recently, or ROS classification criterion which have changed since 1994 (i.e. distance from road, evidence of humans, motorized use, and solitude).

Updating these recreation inventories would ensure that government agencies are able to identify a diverse range of recreation values and uses, and support strategic and tactical planning. Improved recreation resource data is also crucial to the maintenance and enhancement of ecological integrity in areas subject to recreation use. Key knowledge is required to define acceptable levels of appropriate recreation feature use, and identifying and distinguishing commercial and non-commercial recreation use opportunities.

Table 9.2.2 Key Recreation-Visual Landscape Management Issues and Investment Needs, by Forest District, as specified in TSR's and LRMPS.[1]

Key Issues	Source of Issues	Strategic Recreation-Visual Management Knowledge Gap	Geographic Area	VLI/KSA/EVQO Status (if applicable)[2]	Priority[3]
Prince George Forest District					
Uncertainties related to unrefined and outdated visual landscape inventories (VLIs) make the LRMP recommendations of identifying scenic areas, managing visual quality, developing and establishing VQOs in consultation with the public and through landscape unit level planning processes difficult.	LRMP	The LRMP Table made specific recommendations on the high priority areas for which detailed visual landscape inventories should be conducted and VQOs established. The district subsequently prioritized these project areas based on the criteria listed below. Note: The Parsnip River was listed only as requiring a broad inventory, which was done in 1999 but is yet to be known as scenic area.	**Parsnip River**	Broad/Not KSA/No EVQO	L
			Firth Lake	Broad/KSA/Rec. EVQO	M
			Tacheeda Lakes	Detailed (partial) /KSA/Rec. EVQO	M
			Carp Lake	Broad/KSA/Rec. EVQO	M
			Summit Lake	Broad/KSA/Rec. EVQO	M
			Davie Lake	Broad/KSA/Rec. EVQO	M
			Kerry Lake	Detailed/KSA/Rec. EVQO	M
			McLeod Lake	Detailed/KSA/Rec. EVQO	M
			Crooked River	Broad/KSA/Rec. EVQO	M
			Highway 97 N	Detailed/KSA/Rec. EVQO	L
			Highway 97 S	Broad/KSA/Rec. EVQO	H
			Dahl Lake	Broad/KSA/Rec. EVQO	M

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[1] Any other recreation/visual resource management issues and knowledge gaps identified in District Recreation Plans, TFL MPs, LU plans, Historic Trail MPs, Cave MPs, etc. will be integrated into the RMP at a later date.

[2] Broad = VLI mapped at 1:250,000; Detailed = VLI mapped at 1:50,000; No VLI = No VLI mapping available at any scale; KSA = Current Known Scenic Area and supported by LRMP;
rec. KSA = Recommended by LRMP and/or MoF staff to be made known as "scenic areas" by DM; no KSA = Currently not a KSA (i.e. Visually Sensitive Area only) and not recommended by LRMP for formal KSA status but resource development activities should consider visual values; EVQO = Established VQOs currently in place; rec. EVQO = Recommended by LRMP and/or MoF for VQO establishment by DM; no EVQO = No established VQO currently in place and not recommended by LRMP or MoF for formal establishment.

[3] The following guidelines were used to define regional or district priorities for each project area:

High (H): No VLI or outdated broad or detailed VLI requiring immediate update at 1:50,000 for strategic and/or operational planning; and/or geographic area under heavy development pressure; and/or issue or data gap specifically identified by TSR/LRMP; and/or high level of public concern for visual quality/impact in the area.

Medium (M): Broad or detailed VLI in place but requiring update within the next 5 years; and/or moderate level of development pressure in or around the geographic area for the next 5 years; and/or issue or data gap generally referred to in TSR/LRMP; and/or moderate level of public concern for visual quality/impact in the area.

Low (L): Broad or detailed data in place but requiring update beyond the next 5 years; and/or new and up-to-date VLI in place; and/or low or no development pressure in or around the geographic for the next 5 years; and/or issue or data gap generally referred to in TSR/LRMP; and/or low level of public concern for visual quality/impact in the area.

			Norman Lake	Broad/KSA/Rec. EVQO	M
			Bednesti Lake	Detailed/KSA/EVQO	L
			Nechako River	Broad/KSA/Rec. EVQO	M
			Highway 16 E	Detailed/KSA/EVQO	L
			Highway 16 W	Broad/KSA/Rec. EVQO	H
			Green Mountain	Detailed/KSA/EVQO	L
			Blackwater River	Detailed/KSA/EVQO	L
			Alexander Mackenzie Heritage Trail	Detailed/KSA/EVQO	L
Vanderhoof Forest District					
Uncertainties related to unrefined and outdated visual landscape inventories (VLIs) make the LRMP recommendations for managing visual values in scenic areas and establishing Visual Quality Objectives (VQOs) difficult. This lack of up-to-date VLI data has also the potential of unnecessarily constraining timber access and supply (TSRs) in the TSA in addition to making the operational planning process uncertain.	LRMP (January 1997 approved version) TSR2 Data Package Expert knowledge	The LRMP includes a General Management Direction (GMD) dealing with the importance of managing scenic quality for the public and tourism industry. The LRMP recommends specific scenic areas in RMZs to be planned and managed with established VQOs and specific visually sensitive areas to be managed without timber supply constraining VQOs i.e. as "scenic areas without established VQOs". Many areas are also listed as requiring "local area plans" integrating visual and other values. None of these areas have up-to-date detailed VLIs in place. The LRMP recommendations have also been complemented with additional visually sensitive areas historically being managed for visual values as part of developing the Data Package for the TSR2 process. Identifying visual resource values, establishing VQOs, and using this	**Highway 27 Corridor**	Broad/rec. KSA/rec. EVQO	
			West End of Nechako - Range	Broad/rec. KSA/rec. EVQO	
			Knewstubb Lake	Broad/rec. KSA/rec. EVQO	
			Nulki Hills	Broad/rec. KSA/rec. EVQO	
			East flank Sinkut Mtn.	Broad/rec. KSA/rec. EVQO	
			Cluculz Lake	Broad/rec. KSA/rec. EVQO	
			Nulki Lake	Broad/rec. KSA/rec. EVQO	
			Tachick Lake	Broad/rec. KSA/rec. EVQO	
			Kenny Dam Road	Broad/rec. KSA/no EVQO	
			North slopes Fawnie Range	Broad/rec. KSA/rec. EVQO	
			Suscha Lake	Broad/rec. KSA/rec. EVQO	
			Suscha Creek Falls	Broad/rec. KSA/rec. EVQO	
			Endako Mine Road	Broad/rec. KSA/rec. EVQO	
			North shore Francois Lake	Broad/rec. KSA/rec. EVQO	
			Francois Lake Road	Broad/rec. KSA/rec. EVQO	

		information in planning and visual design require up-to-date visual landscape inventory (VLI) data. Most of the viewscapes identified in the LRMP, TSR, and from expert knowledge (see next column) are currently inventoried broadly at 1:250,000 and although there exists a few detailed VLI at 1:50,000, they are outdated. In addition, broad VLIs do not take into account the screening effect found in the field by vegetation and topography, which has shown to unnecessarily inflate the size of areas mapped as being visually sensitive. Many of the areas broadly inventoried are recommended for VQO establishment which is not the recommended scale for establishing VQOs due to area overestimation problem explained above. This knowledge gap not only impacts timber supply and the implementation of the LRMP recommendations, but render operational planning difficult with the risk of creating adverse visual impacts and negatively affecting visual, recreation and tourism values in the short-term and long term. To address these issues, detailed VLIs would provide the improved knowledge base necessary to implement the LRMP recommendations and increase certainty about the effects of strategic decisions on timber supply (TSR3) and greatly improve the operational planning process. In addition, detailed up-to-date VLIs improve land stewardship and better meet the Forest Stewardship Council principles.	**Glennanan Road**	Broad/rec. KSA/rec. EVQO	
			Telegraph Trail - (road portions)	Broad/rec. KSA/rec. EVQO	
			North shore Fraser Lk.	Broad/rec. KSA/rec. EVQO	
			Peta Lake	Broad/rec. KSA/rec. EVQO	
			Top Lake North	Broad/rec. KSA/rec. EVQO	
			Fraser Mountain	Broad/rec. KSA/rec. EVQO	
			Red Mountain - (Deserter Peak)	Broad/rec. KSA/rec. EVQO	
			Deserter Lake	Broad/rec. KSA/rec. EVQO	
			Stern Lake	Broad/rec. KSA/rec. EVQO	
			Stellako River	Broad/rec. KSA/rec. EVQO	
			Nithi Mountain - (southwest flank)	Broad/rec. KSA/no EVQO	
			South Nithi Valley	Broad/rec. KSA/rec. EVQO	
			Nechako River	Broad/rec. KSA/rec. EVQO	
			Murray Lake	Broad/rec. KSA/rec. EVQO	
			Hobson Lake	Broad/rec. KSA/rec. EVQO	
			Stuart River	Broad/rec. KSA/rec. EVQO	
			North Shore Finger Lk.	Broad/rec. KSA/rec. EVQO	
			Fish Lake South	Broad/rec. KSA/rec. EVQO	
			Fish Lake North	Broad/rec. KSA/rec. EVQO	
			Grizzly Lake	Broad/rec. KSA/rec. EVQO	
			Woodcock Lake	Broad/rec. KSA/rec. EVQO	
			Cobb Lake	Broad/rec. KSA/rec. EVQO	
			Graveyard Lake	Broad/rec. KSA/rec. EVQO	
			Bobtail Lake	Broad/rec. KSA/rec. EVQO	
			Chowsunkut Lake	Broad/rec. KSA/rec. EVQO	

			Greer Mountain	Broad/rec. KSA/rec. EVQO	
			Mount Hobson	Broad/rec. KSA/rec. EVQO	
			Tsacha Lake	Broad/rec. KSA/rec. EVQO	
			Naglico Hills - (Tommy Lakes)	Broad/rec. KSA/rec. EVQO	
			Kuyakuz Lake	Broad/rec. KSA/rec. EVQO	
			Tatelkuz Lake	Broad/rec. KSA/rec. EVQO	
			Lucas Lake	Broad/rec. KSA/rec. EVQO	
			Brewster Lake	Broad/rec. KSA/rec. EVQO	
			Devil's Thumb/Devil's – Thumb Lake	Broad/rec. KSA/rec. EVQO	
			Casey Lake	Broad/rec. KSA/rec. EVQO	
			Cheslatta Falls	Broad/rec. KSA/no EVQO	
			Cheslatta Trail	Broad/rec. KSA/rec. EVQO	
			Duten/Gluten Lakes	Broad/rec. KSA/rec. EVQO	
			Johnson Lake/Jenyo – Lake Trail	Broad/rec. KSA/rec. EVQO	
			Fawnie Creek	Broad/rec. KSA/rec. EVQO	
			Kiez Lake	Broad/rec. KSA/rec. EVQO	
			26 Mile Lake	Broad/rec. KSA/rec. EVQO	
			Patrick George Lake	Broad/rec. KSA/no EVQO	
			Louie George Lake	Broad/rec. KSA/no EVQO	
			Bitch lake	Broad/rec. KSA/no EVQO	
			Sinkut Mountain North	Broad/rec. KSA/rec. EVQO	
			Rum Cache Lake	Broad/rec. KSA/rec. EVQO	
			Fraser Lake / Stuart - Lake Pack Trail	Broad/rec. KSA/rec. EVQO	
			Moose Lake	Broad/rec. KSA/rec. EVQO	

			Secord Lake	Broad/rec. KSA/rec. EVQO	
			Johnny Lake	Broad/rec. KSA/rec. EVQO	
			Laidman Lake	Broad/rec. KSA/rec. EVQO	
			Omineca Trail	Broad/rec. KSA/rec. EVQO	
			Home Lake Trail	Broad/rec. KSA/rec. EVQO	
			Ormond Creek Trail	Broad/rec. KSA/rec. EVQO	
			Ormond Lake	Broad/rec. KSA/rec. EVQO	
			Oona Lake	Broad/rec. KSA/rec. EVQO	
			Etcho Lake	Broad/rec. KSA/rec. EVQO	
			Echo Lake	Broad/rec. KSA/rec. EVQO	
			Hogsback Lake & - Telegraph Trail	Broad/rec. KSA/rec. EVQO	
			McKay Lake	Broad/rec. KSA/rec. EVQO	
			Cabin Creek Falls	Broad/rec. KSA/rec. EVQO	
			Greer Creek Falls	Broad/rec. KSA/rec. EVQO	
			Messue Wagon Road	Broad/rec. KSA/rec. EVQO	
			Blue Mountain Demo – Forest	Broad/rec. KSA/rec. EVQO	
			Waterlily Trails	Broad/rec. KSA/no EVQO	
			Crystal Lakes Area	Broad/rec. KSA/no EVQO	
			East Blackwater –	Broad/rec. KSA/rec. EVQO	
			River/Euchiniko Lakes	Broad/rec. KSA/rec. EVQO	
			West Blackwater/Wolf & -Naglico Lakes	Broad/rec. KSA/rec. EVQO	
			Targe Creek Corridor	Broad/rec. KSA/rec. EVQO	
			Majuba Lake	Broad/rec. KSA/no EVQO	
			Gatcho Lake Area	Broad/rec. KSA/no EVQO	
			Wilderness -	Broad/rec. KSA/rec. EVQO	

			Lakes/Chipmunk & - Ziegler Lakes		
Fort St. James Forest District					
Uncertainties related to unrefined and outdated visual landscape inventories (VLIs) make the LRMP recommendations of identifying, managing, and protecting the integrity of important viewscapes for commercial and non-commercial recreation, making scenic areas known, and establishing VQOs difficult. This lack of up-to-date VLI data has also the potential of unnecessarily constraining timber access and supply (TSRs) in the TSA. •	LRMP (March 1999 Government approved version)	The LRMP provides recommendations on specific geographic areas or viewscapes within RMZs for which visual quality management is considered important when planning and designing resource development activities. In addition, the LRMP provides specific recommendations on the areas requiring VLIs and the establishment of VQOs by the DM. The LRMP also includes General Management Directions (GMD) dealing with the identification of visual management areas to manage the aesthetic characteristics of wilderness-based tourism recreation; identify visually sensitive areas and develop VQOs for the plan area; integrate visual values into resource management practices; and address the maintenance of the visual quality associated with Classified waters in resource development plans. Two others GMDs specifically deal with VQOs: 1) Where established, VQOs will apply to commercial timber harvesting and should guide incidental timber cutting associated with other resource user activities, and 2) For those lakes and rivers without established VQOs, consider the potential high scenic value in resource management operations and prioritize them for the establishment of VQOs.	**Takla Lake** (inc. Frypan Peak; Mitchell Range; Mt. Bates; Sitlika Range; Carrall Range; Mt. Bodine; Redslide Peak; Mount Lovell; Mt. Teegee; Wedge Mtn.; Pyramid Peak) **Middle River** (inc. Mt. Sidney Williams) **Sustut River** (Lower) **Sustut River** (Upper) **Tsayta Lake** (northwest corner) **Stuart Lake** (inc. Mt. Rosetti; Mt. Beals; Shass Mtn.;Mt. Nielsp) **Trembleur Lake** (inc. Mt. Copley;	Detailed/KSA/rec. EVQO (Partial detailed VLI for Takla Lake and broad VLI for the remaining viewscapes (Part of lake viewshed within a PPA) Detailed/KSA/no EVQO Detailed/KSA/rec. EVQO (Adopt VQOs as proposed in Sustut LRUP) Broad/KSA/no EVQO (Portions within a PPA) Broad/KSA/rec. EVQO (most of the viewshed within a PPA) Detailed/KSA/rec. EVQO (Detailed VLI for Stuart Lake and broad VLI for the remaining viewscapes) (West side of North Arm within a PPA) Detailed/KSA/rec. EVQO (west part of lake viewshed within	

		Identifying visual resource values, establishing VQOs, and using this information in planning and design require up-to-date visual landscape inventory (VLI) data. Most of the viewscapes identified in the LRMP (see next column) are currently inventoried broadly at 1:250,000 or although some detailed VLI at 1:50,000 do exist, they are outdated (except for Tchentlo and Chuchi Lakes currently under work).	Tchentsut Mtn.; Mt. Sidney Williams)	a PPA)	
			Grassham Lake	Broad/KSA/no EVQO	
			Ogston Lake	Broad/KSA/no EVQO	
			Camsell Lake	Detailed/KSA/no EVQO (Partial detailed VLI)	
			Whitefish Lake	Broad/KSA/no EVQO	
			Tezzeron Lake (inc. Chuius Mtn.)	Detailed/KSA/no EVQO	
		The broad VLIs do not take into account the screening effect found in the field by vegetation and topography, which has shown to unnecessarily inflate the size of areas mapped as being visually sensitive. The detailed but outdated VLIs may also contribute in overestimating the size of visually sensitive areas or may underestimate them if new viewpoints have to be added or vegetative screens have been removed since the last inventory. Also, many of the areas recommended for VQO establishment are only inventoried broadly at 1:250,000, which is not the recommended scale for establishing VQOs due to area overestimation problem explained above.	**Witch Lake**	Broad/KSA/rec. EVQO	
			Tchentlo Lake (inc. portions of Mitchell Range)	Detailed/KSA/rec. EVQO (New VLI to be completed during 2000 field season) (LRMP recommendation to consider the establishment of a master VQO of Retention in the immediate viewscape (shoreline) and Partial Retention within the remaining viewscapes of the lake).	
		The knowledge gaps identified above not only impact timber supply and the implementation of the LRMP recommendations, but render operational planning difficult with the risk of creating adverse visual impacts and negatively affecting visual, recreation and tourism values in the short-term and long term.	**Chuchi Lake**	Detailed/KSA/rec. EVQO (New VLI to be completed during 2000 field season) (LRMP recommendation to consider the establishment of a master VQO of Retention in the immediate viewscape (shoreline) and Partial Retention within the remaining viewscapes of the lake).	
		To address these issues, detailed VLIs would provide the improved knowledge base necessary to implement the LRMP recommendations and increase certainty	**Indata Lake**	Broad/KSA/rec. EVQO	

		about the effects of strategic decisions on timber supply (TSR3). In addition, detailed up-to-date VLIs would better meet the Forest Certification principles.		(Most of the viewshed within a PPA)	
			Great Beaver Lake	Detailed/KSA/no EVQO	
			Sustut Lake	Broad/KSA/no EVQO	
			Johanson Lake	Broad/KSA/no EVQO	
			Asitka Lake	Broad/KSA/no EVQO	
			Goldway Lake & Peak	Broad/KSA/no EVQO	
			Jaw Lake	Broad/KSA/no EVQO	
			Cripple Lake	Broad/KSA/no EVQO	
			Carrier Lake	Detailed/KSA/no EVQO	
			Kalder (Horseshoe) Lk.	Broad/KSA/no EVQO	
			Ocock Lake	Detailed/KSA/no EVQO	
			Pinchi Lake	Broad/KSA/no EVQO	
			Blackburn Lake	Broad/KSA/no EVQO	
			Tachie River	Broad/KSA/no EVQO	
			Nanna Lake	Broad/KSA/no EVQO	
			Marie Lake	Broad/KSA/no EVQO	
			Butterfield Lake	Broad/KSA/no EVQO	
			Cunningham Lake	Detailed/KSA/no EVQO (North side of lake viewshed within a PPA)	
			Bolcome Lake Chain	Broad/KSA/no EVQO	
			Nation River (lower)	Broad/KSA/rec. EVQO (Completion of VLI specifically recommended by LRMP) (LRMP recommendation to consider the establishment of a master VQO of Partial Retention	

				along the viewscape of the river)	
			Kazchek Falls	Broad/KSA/no EVQO	
			Driftwood River	Broad/KSA/no EVQO	
			(inc. Carrall Ridge; Centre Peak; Driftwood		
			Range; Iktlaki Peak; Nankai Peak)		
			Kaza Lake		
			(inc. Cariboo Heart Range)	Broad/KSA/no EVQO	
			Yuen Lake	Broad/KSA/no EVQO	
			Nanitsch Lake	Broad/KSA/no EVQO	
			(inc. Cariboo Heart		
			Range)		
			Canyon Lake	Broad/KSA/no EVQO	
			The following are current		
			'known scenic areas" not specifically listed in the LRMP but still requiring up-to-date VLIs to manage the visual resource:		
			28 Mile Lake	Broad/KSA/no EVQO	
			Ahdatay Lake	Broad/KSA/no EVQO	
			Airline Lake	Broad/KSA/no EVQO	
			Akus Lake	Broad/KSA/no EVQO	
			Albert Lake	Broad/KSA/no EVQO	

			Axelgold Range	Broad/KSA/no EVQO	
			Azuklotz Lake	Broad/KSA/no EVQO	
			Bear Lake & River (inc. Connelly Range/Thumb)	Broad/KSA/no EVQO	
			Beaverlodge Lake	Broad/KSA/no EVQO	
			Bearverpond Lake	Broad/KSA/no EVQO	
			Benoit Lake	Broad/KSA/no EVQO	
			Bugle Lake	Detailed/KSA/no EVQO	
			Byrnes Lake	Broad/KSA/no EVQO	
			Calais Lake	Broad/KSA/no EVQO	
			Camp (Nilan) Lake	Broad/KSA/no EVQO	
			Damshilgwit Lake	Broad/KSA/no EVQO (within a PPA)	
			Dan Miner Lake	Broad/KSA/no EVQO	
			Darb Lake	Broad/KSA/no EVQO	
			Dargie Lake	Broad/KSA/no EVQO	
			Dawn Lake	Broad/KSA/no EVQO	
			Dem Lake	Broad/KSA/no EVQO	
			Dia Lake	Broad/KSA/no EVQO	
			Diver Lake & Peak	Broad/KSA/no EVQO	
			Dolphin Lake	Broad/KSA/no EVQO	
			Donald Lake	Broad/KSA/no EVQO	
			Drift Lake	Broad/KSA/no EVQO	
			Duti Lake (North & South)	Broad/KSA/no EVQO	
			Electra Lake	Broad/KSA/no EVQO	
			Elliott Lake	Broad/KSA/no EVQO	

			Elmore Lake **Fable Lake** **Foerster Lake** **Fumar Creek** **Gidegingla Lake** **Gordon Lake** **Green Lake** **Hatdudatehl Lake** **Henning Lake** **Highway 27** **Humphrey Lake** **Hunitlin Mountain** **Inzana Lake** **Island Lake** **Jenny Lake** **Jumping Lake** **Karena Lake** **Kazchek Lake** **Kelly Lake** **Keppel Lake** **Kettle Glaciers** **Kloch Lake** **Kluatantan Lakes** **Kluatantan River** **Kluayaz Lake** **Kotsine Falls** **MacDonald Lake**	Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO (within a PPA) Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Detailed/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO	

			Macdougall Lake	Broad/KSA/no EVQO	
			McKnab Lake	Broad/KSA/no EVQO	
			Mossvale Lake	Broad/KSA/no EVQO	
			Motasse Lake	Broad/KSA/no EVQO	
			Mount Alexander	Broad/KSA/no EVQO	
			Mount Gordon	Broad/KSA/no EVQO	
			Mount Grant	Broad/KSA/no EVQO	
			Mount Laidlaw	Broad/KSA/no EVQO	
			Mount Tom	Broad/KSA/no EVQO	
			Murray Ridge	Broad/KSA/no EVQO	
			Murray Ridge High	Broad/KSA/no EVQO	
			Nahounli Lake	Broad/KSA/no EVQO (North side within a PPA)	
			Nancut Creek & Trail	Broad/KSA/no EVQO	
			Natazutlo Lake	Broad/KSA/no EVQO	
			Nation River (Upper)	Broad/KSA/no EVQO	
			Nautley-Sowchea Historical Trail	(VQC of Retention recommended for 100m on each side of the trail centerline by Trail Planning Team)	
			No Name Lakes	Broad/KSA/no EVQO (Eastern lake within a PPA)	
			North Road	Broad/KSA/no EVQO	
			Ocock River	Broad/KSA/no EVQO	
			Omineca River (inc. Mount Ogden)	Broad/KSA/no EVQO (eastern portion within a PPA)	
			Otterson Lake	Broad/KSA/no EVQO	

			Pam Lake	Broad/KSA/no EVQO	
			Pinchi Road	Broad/KSA/no EVQO	
			Prudential Mountain	Broad/KSA/no EVQO	
			Purvis Lake	Broad/KSA/no EVQO	
			Rock (Glaucers Lake)	Broad/KSA/no EVQO (within a PPA)	
			Rubyrock Lake	Broad/KSA/no EVQO	
			Salmon Lake	Detailed/KSA/no EVQO	
			Salmon River	Broad/KSA/no EVQO	
			Silver Lake	Broad/KSA/no EVQO	
			Skeena River	Broad/KSA/no EVQO	
			Slamgeesh Lake	Broad/KSA/no EVQO (within a PPA)	
			Spawning Lake	Broad/KSA/no EVQO	
			Specularite Lakes	Broad/KSA/no EVQO (within a PPA)	
			Starret Lake	Broad/KSA/no EVQO	
			Stuart River	Broad/KSA/no EVQO (mostly within a PPA)	
			Tachie Road	Broad/KSA/no EVQO	
			Takatoot Lake	Detailed/KSA/no EVQO	
			Tatsadah Lake	Broad/KSA/no EVQO	
			Teardrop Lake	Broad/KSA/no EVQO	
			Tetana Lake	Broad/KSA/no EVQO	
			Thompson Lake	Broad/KSA/no EVQO	
			Tom Lake	Broad/KSA/no EVQO	
			Tomas Lake	Broad/KSA/no EVQO	
			Tsaytut Spur	Broad/KSA/no EVQO	

			Tsilcoh Falls	Broad/KSA/no EVQO	
			Tsilcoh River	Broad/KSA/no EVQO	
			Tulle Lake	Broad/KSA/no EVQO	
			Tureen Lake	Broad/KSA/no EVQO	
			Tzahny Lake	Broad/KSA/no EVQO	
			Wudtsi Lake	Broad/KSA/no EVQO	
			Yatzutzin Lake	Broad/KSA/no EVQO	
Mackenzie Forest District					
Uncertainties related to unrefined and outdated visual landscape inventories (VLIs) make the LRMP recommendations of identifying, managing, and protecting the integrity of important viewscapes for commercial and non-commercial recreation, making scenic areas known, and establishing VQOs difficult. This lack of up-to-date VLI data has also the potential of unnecessarily constraining timber access and supply (TSRs) in the TSA.	LRMP (June 2000 version)	The LRMP provides specific recommendations on geographic areas or viewscapes for which visual quality management is important enough to have them made known as "scenic areas". The Table also made specific recommendations on the areas for which VQOs should be established by the DM. There are also a few areas for which the Table did not find necessary to recommend that they be formally designated as "know scenic areas" or to be managed with established VQOs. However, The Table did agree that resource development activities in these areas should consider visual quality where required. Some areas listed in the LRMP have no VLI data in place at any scale. The rest of the viewscapes identified in the LRMP are currently inventoried broadly at 1:250,000 or in detail at 1:50,000 but both levels of inventory are outdated. In addition, the broad VLI does not take into account the screening effect found in the field by vegetation and topography, which has shown to unnecessarily inflate the size of areas mapped as visually sensitive. Detailed but outdated VLIs may also overestimate the size of visually sensitive	**Mackenzie Town site** viewshed, including Morfee Lakes	Detailed/KSA/rec. EVQO	
			Germansen Corridor	Detailed/KSA/no EVQO	
			Gataga River	Broad/rec. KSA/no EVQO	
			Johiah Lake	Broad/rec. KSA/no EVQO	
			Obo Lake	Broad/rec. KSA/rec. EVQO	
			Large unnamed lake west of Obo Lake	Broad/rec. KSA/rec. EVQO	
			Frog River	Broad/rec. KSA/no EVQO	
			Spinel Lake	Broad/rec. KSA/no EVQO	
			Finlay River	Broad/no KSA/no EVQO	
			Obo River	No VLI/no KSA/no EVQO	
			Driftpile Lake	Broad/rec. KSA/no EVQO	
			Braid (Sheep) Ck./ Kechika Rv. Confluence	Broad/rec. KSA/no EVQO	
			Citreon (Big) Creek/	Broad/rec. KSA/no EVQO	

		areas or may underestimate them if new viewpoints have to be added or vegetative screens have been removed since the last inventory. Also, many of the areas recommended for VQO establishment are only inventoried broadly at 1:250,000, which is not the recommended scale for establishing VQOs due to area overestimation problem explained above. The knowledge gaps identified above not only impact timber supply and the implementation of the LRMP recommendations, but render operational planning difficult with the risk of creating adverse visual impacts and negatively affecting visual, recreation and tourism values in the short-term. To address these issues, detailed VLIs would provide the improved knowledge base necessary to implement the LRMP recommendations and increase certainty about the effects of strategic decisions on timber supply (TSR3). In addition, detailed up-to-date VLIs would better meet the Forest Certification principles.	Kechika Rv. confluence		
			Sifton Pass	No VLI/rec. KSA/no EVQO	
			Kechika River inc. Davie Trail	Broad/no KSA/no EVQO	
			Fort Ware	Detailed/KSA/rec. EVQO	
			Weissener Lake	Broad/rec. KSA/no EVQO	
			Fox Lake	Broad/rec. KSA/no EVQO	
			Area southwest of Warneford/Kwadacha Forks	Broad (Partial VLI)/ rec. KSA/no EVQO	
			Baby Lake	Broad/rec. KSA/no EVQO	
			Thutade Lake	Broad/rec. KSA/no EVQO	
			Toodoggone Lake	Broad/rec. KSA/rec. EVQO (specifically Retention)	
			Toodoggone River (to the confluence of Finlay River)	No VLI/rec. KSA/rec. EVQO (specifically Retention)	
			Pelly Lake	Broad/rec. KSA/no EVQO	
			Barrier Pass	No VLI/rec. KSA/no EVQO	
			Tsay Keh	Detailed/rec.KSA/rec. EVQO	
			Ed Bird – Estella Lakes	Detailed/KSA/rec. EVQO	
			Herchmer Pass	Broad/rec. KSA/no EVQO	
			Tobin Lake	Broad/rec. KSA/no EVQO	
			Aiken Lake	Broad/rec. KSA/no EVQO	
			Tutizzi Lake	Detailed/KSA/no EVQO	
			Osilinka Lakes (also known as Big Big	Broad/rec. KSA/no EVQO	

			and Little Big Lakes)		
			Uslika Lake	Broad/rec. KSA/no EVQO	
			Nina Lake	Detailed/rec. KSA/no EVQO	
			Shadow Lakes	Broad/rec. KSA/no EVQO	
			Shadow Lk. Camp Area	Broad/rec. KSA/rec. EVQO	
			Discovery Creek viewshed (as seen from major viewpoints on Omineca River within the PPA)	No VLI/rec. KSA/no EVQO	
			Duckling Creek viewshed (as seen from major viewpoints on Omineca River within the PPA)	No VLI/rec. KSA/no EVQO	
			Twenty Mile Creek viewshed (as seen from major viewpoints on Omineca River within the PPA, from Gebhardt Arm, Germansen Lake PPA, and from Twenty Mile Guide Camp)	No VLI/rec. KSA/no EVQO	
			Viewshed from 10 Mile and 14 Mile	Detailed/KSA/no EVQO (Viewshed part of the Germansen Corridor, which is already a KSA as recommended by LRMP)	
			Germansen Mountain (as seen from PPA section of the Omineca River, Gebhardt Arm, and Germansen Lake	Detailed/KSA/no EVQO	
			Manson Creek		

			Community	Detailed/KSA/no EVQO	
			Baldy Trail		
			Manson Lakes	Broad/rec. KSA/no EVQO	
			Wolverine Lakes	Detailed/KSA/rec. EVQO	
				Detailed/KSA/no EVQ	
				(inventoried from FSR &	
			Klawli Lake	Recreation Site only)	
			Tsaydachi Lake	Broad/rec. KSA/no EVQO	
			Wicked River Bay	Broad/rec. KSA/no EVQO	
			Selwyn Bay	Detailed/KSA/no EVQO	
			Clearwater Bay	Detailed/KSA/no EVQO	
			Ducette Bay	Detailed/KSA/no EVQO	
			Nabesche Bay	Detailed/KSA/no EVQO	
			Schooler Bay	Detailed/KSA/no EVQO	
			Bernard Bay	Detailed/KSA/no EVQO	
			Point (Creek) Bay	Detailed/KSA/no EVQO	
			Canty Lake	Detailed/KSA/no EVQO	
			Curve Lake	Broad/rec. KSA/no EVQO	
			Shoal Lake	Broad/rec. KSA/no EVQO	
			Finlay Bay	Broad/rec. KSA/no EVQO	
			Dina Lake #1	Detailed/KSA/rec. EVQO	
			Heather Lake	Broad/rec. KSA/rec. EVQO	
			Cut Thumb Bay	Broad/rec. KSA/rec. EVQO	
			Clearwater Lake	Broad/rec. KSA/rec. EVQO	
			Highway 97	Broad/rec. KSA/no EVQO	
			Highway 39	Detailed/KSA/rec. EVQO	
			Sabai Lake	Detailed/KSA/no EVQO	
			Tudyah Lake	Broad/rec. KSA/no EVQO	

			Burden Lake **Nation River** (as seen from viewpoints on the water upstream from the bridge at 25km on the Nation FSR to the Plan Area western boundary) **Butternut Lake**	Detailed/rec. KSA/no EVQ (partial VLI from hwy only) Broad/rec. KSA/no EVQO Broad/rec. KSA/no EVQO Broad/rec. KSA/no EVQO	
Dawson Creek Forest District					
Uncertainties related to unrefined and outdated visual landscape inventories (VLIs) make the LRMP recommendations of identifying scenic areas, managing visual quality, developing and establishing VQOs in consultation with the public and through landscape unit level planning processes difficult. Although the last TSR did include in the final analysis the detailed VLIs data, which resulted in substantial timber supply gain compared to the broad data that were used earlier in the process, the lack of up-to-date VLIs data has also the potential of unnecessarily constraining timber access and supply (TSRs) in the TSA.	LRMP	The LRMP Table did not recommend the deletion of any specific scenic areas currently known in the Dawson Creek TSA or in the TFL but did recommend the addition of new scenic areas. The LRMP Table did not recommend that currently established VQOs be removed or new ones established for the time being. However, the LRMP Table does recognize that additional scenic areas may be identified and made known in the future and more VQOs be developed and established by the MoF in consultation with the public where concerns exist. A related strategy in the plan is that the LU Planning process identifies the scenic areas requiring the establishment of site-specific VQOs. The currently known scenic areas are either inventoried broadly at 1:250,000 or in detail at 1:50,000 but both levels of inventory are outdated. Broad VLIs do not take into account the screening effect found in the field by vegetation and topography, which has shown to unnecessarily inflate the size of areas mapped as visually sensitive. Detailed but	**Peace River Corridor** **Moberly River Corridor** **Pine River** (Chetwyn to Peace River) **Hart Highway** (inc. Bickford Lookout Trail) **Murray River Corridor** **Bulley Valley** **Sukunka River Corridor** (inc. Windfall Ck. Rec. Site) **Williston Lake Corridor**	Broad & Detailed/KSA/ EVQO Broad/KSA/no EVQO Broad & Detailed/KSA/ EVQO (for \ortions of river visible from Hwy 97) Detailed/KSA/EVQO Detailed/KSA/EVQO Broad/KSA/no EVQO Broad/KSA/no EVQO Detailed/KSA/EVQO (except for a gap with no VLI along the south shore in the TSA) Note: Detailed VLI update done in 1999 in TFL 48	

		outdated VLIs may also overestimate the size of visually sensitive areas or may underestimate them if new viewpoints have to be added or vegetative screens have been removed since the last inventory. The LRMP is also presenting a strategy under the General Management Direction dealing specifically with maintaining the broad VLI mapping at 1:250,000 up-to-date for incorporation into the LU and operational planning processes. This in turn requires that the detailed 1:50,000 VLI mapping be also maintained up-to-date to feed in into the broad VLI update. The knowledge gaps identified above not only impact timber supply and the implementation of the LRMP recommendations, but render operational planning difficult with the risk of creating adverse visual impacts and negatively affecting visual, recreation and tourism values in the short-term. To address these issues, detailed VLIs would provide the improved knowledge base necessary to maintain the 1:250,000 broad VLI, increase certainty about the effects of strategic decisions on timber supply (TSR3), LRMP recommendations, and SLUP implementation. In addition, detailed up-to-date VLIs would better meet some of the Forest Certification principles.	**Jackfish Lake**	Broad/KSA/no EVQO	
			Halfmoon Lake	Broad/KSA/no EVQO	
			Stewart Lake	Broad/KSA/no EVQO	
			Highway 29	Detailed/KSA/EVQO	
			Heritage **Hwy** (inc. Flatbed Ck., Stony Lake, Redwillow River & Thunder Ck. Rec. Sites)	Detailed/KSA/EVQO	
			Kiskatinaw Bridge	Broad/KSA/no EVQO	
			Salt Ridge/Murray Salt Ridge Connector Snow Trails	Broad/KSA/no EVQO	
			Wright Lake	Broad/KSA/no EVQO	
			Wapiti Crossing Recreation Site	Broad/KSA/no EVQO	
			Wapiti/Onion Lakes & Trails	Broad/KSA/no EVQO	
			Wapiti River Rec. Site	Broad/KSA/no EVQO	
			Tuck Lake	Broad/KSA/no EVQO (in a PPA)	
			Belcourt Lake	Broad/KSA/no EVQO	
			Warner Lake	Broad/KSA/no EVQO	
			Lone Prairie North	Broad/KSA/no EVQO	
			Lone Prairie South	Broad/KSA/no EVQO	
			Moose Lake	Broad/KSA/no EVQO	
			Bearhole Lake	Broad/KSA/no EVQO (in a PPA)	
			Blackhawk Lake	Broad/KSA/no EVQO	
			Foot Lake	Broad/KSA/no EVQO	

			Boulder Lake Rec. Site	Broad/KSA/no EVQO	
			Bickford Lake	Broad/KSA/no EVQO	
			Hook Lake	Broad/KSA/no EVQO	
			Anderson Lake	Broad/KSA/no EVQO	
			Twin Sisters (Beattie) Peaks (views from the peaks)	No VLI/rec. KSA/no EVQO	
			Scenic values along the traditional access corridors in the Twin Sisters RMZ	No VLI/rec. KSA/no EVQO	
			Views within Twin Sisters RMZ as seen from the Klin-se-za PPA	No VLI/rec. KSA/no EVQO	
			Boudreau Lake	Broad/KSA/no EVQO (in a PPA)	
			Lemoray Lakes	Broad/KSA/no EVQO (in a PPA)	
			Heart Lake	Detailed/KSA/EVQO (in a PPA)	
			Greg Duke Rec. Site	Broad/KSA/no EVQO	
			Bear Mountain Community Forest	Broad/KSA/no EVQO	
			Snow Lake	Broad/KSA/no EVQO	
			Babcock Trail	Broad/KSA/no EVQO	
			Hambler Lakes	Broad/KSA/no EVQO	
			Dinosaur Lake	Broad/KSA/no EVQO	
			Dimsdale Lake	Broad/KSA/no EVQO (in a PPA)	

Vegetation Resource Inventories

A prerequisite for Sustainable Forest Management is an accurate description of the current state (size, composition and structure) and dynamics (rate and direction of change) of the forest, and the spatial and temporal nature of resource allocation to users. SFM objectives and resulting strategy are based on human values, most of which are related to one or combination of the following factors:

- a specific stand type
- a specific pattern of stand types
- a specific stage of stand development, or
- a specific pattern of stand development stages.

The vintage of most forest resource inventories in the Region is old (often exceeding 20 years), particularly in the Peace River and Fort Nelson management units. The accuracy and reliability of some of these inventories makes future projections of timber and non-timber values uncertain. Uncertainty in the present and future forest condition makes strategic resource planning difficult. In many cases, improving forest resource information represents the single most effective forest management strategy. Creation of new or improved information on the state of the forest and its stands, sites and waterbodies may offer potential solutions to resource supply constraints, depending on the nature of the forest and supply problems.

As outlined in Section 8, improving the state of the vegetation resource inventory throughout the region must begin with consolidation of all known resource inventory information with the dual objective of making known information available, and evaluating it's accuracy and reliability. An output of this project is a strategic plan for subsequently enhancing inadequate information. This process must be untaken in each management unit, considering not only the age of the existing inventory, but also the timeliness relative to TSR. Investment emphasis is recommended for Fort Nelson, Fort St. John and Dawson Creek in view of the more serious state of timber emphasis inventories in these districts. A similar emphasis is recommended for the Vanderhoof supply block to support the IFPA initiative there. Table 9.2.4 provides the VRI investment requirements, and recommended project timing considered appropriate fo the scale of the problem.

Table 9.2.4. **VRI Inventory Strategic Investments Required in the Prince George Forest Region.**

Forest District	20001/02 ($)	2002/03 ($)	2003/04 ($)	2004/05 ($)	2005/06 ($)
Prince George	150 000	100 000	100 000	0	0
Robson Valley	0	250 000	250 000	0	0
Vanderhoof	600 000	250 000	0	0	0
Fort St. James	0	0	0	0	0
Mackenzie	75 000	500 000	500 000	500 000	0
Dawson Creek	350 000	250 000	0	0	0
Fort St. John	1 000 000	750 000	750 000	500 000	500 000
Fort Nelson	1 250 000	1 000 000	500 000	500 000	0
Total Investments	3 425 000	3 100 000	2 100 000	1 500 000	500 000

Growth and Yield Inventory – Site Productivity

This category is a mis-classification of the issue. Site productivity is not a land base property per se. Site productivity potential is an expression of forest land capability for a given tree species - site productivity is always expressed as a stand attribute. Nevertheless, this information is a key element in the projection of stand dynamics and yield across the entire region. Without an accurate means of projecting stand, and ultimately forest growth, the supply of forest values cannot be determined, and meaningful and efficient SFM management strategies are not possible.

Section 8 describes two strategies for resolving the paucity of site productivity potential information. Initially, all local knowledge and information concerning site productivity potential for timber production must be consolidated, organised and extended. A further output of this strategy is development of a tactical plan for improving the state of knowledge. The second strategy, guided by the first, is a growth and yield research core activity, in addition to a local data collection initiative. Research is required to resolve knowledge gaps on site productivity estimation procedures, followed by the collection of local data within each management unit.

Ecosystem Inventories

Biogeoclimatic (BGC) unit mapping has existed for most of the Prince George region for about 15 years. During this time period periodic updates of certain portions of the region have been conducted as time and budget have allowed. Inadequacy of the existing mapping for current planning processes and other operational needs makes a complete update critical.

The original mapping was done by making use of field information and relationships between BGC unit breaks and elevation to draw ink lines on mylars of 1:250 000 NTS maps. This original line work was digitized along with some updates to form the latest digital BGC layer. A hardcopy of the new digital linework was photographically overlain with 1:250 000 NTS maps to form the existing 1:250 000 BGC unit hard copy maps. Due to shifts in scale etc. during the steps outlined above current hard copy maps available are inaccurate.

Current planning exercises including Landscape Unit Planning (LUP) require mapping at a finer scale (i.e., 1:20 000). Some licensees have been updating the BGC layer in conjunction with Terrestrial Ecosystem Mapping (TEM) and Predictive Ecosystem Mapping (PEM) projects. The areas completed either consist of TFL's or landscape units. This piecemeal approach to updating the linework is inefficient and means that not all areas have the same quality of information.

The estimated cost of enhancing the precision of ecosystem map products is $240 000 over a three year period. The estimated budget for 2001/02 is $120 000This work would be conducted by Craig DeLong (MoF, Region), in partnership with Marvin Eng and Del Meidinger (MoF, Research Branch). Within two years a variety of inventory/decision-support products would be produced including:

- downloadable electronic BGC coverage (ARC and IGDS formats) for Prince George Region available at a web or ftp site;
- print on demand colour maps of:
- each district at approx. 1:600 000 scale;
- the region at approx. 1:800 000 scale; and
- each 1:250 000-map-sheet in the region including contour lines and roads

Fish and Fish Habitat Inventories

The inventory census is incomplete for population and habitat information concerning northern fish species and fisheries habitat. Inadequate or unreliable knowledge prevents the definition of clear and measurable objectives, thereby frustrating effective management planning. Without a means of projecting future populations and habitat supply of species such as Bull trout, Arctic Grayling, a conservation management strategy in most forest management units is impossible. The reader is directed to Section 8 for details on strategies for improving fisheries inventories. Table 9.2.7

Table 9.2.7 Fisheries Inventory Strategic Investments Required in the Prince George Forest Region.

Forest District	20001/02 ($)	2002/03 ($)	2003/04 ($)	2004/05 ($)	2005/06 ($)
Prince George	160 000	285 000	285 000	285 000	35 000
Robson Valley	160 000	285 000	285 000	285 000	35 000
Vanderhoof	160 000	285 000	285 000	285 000	35 000
Fort St. James	160 000	285 000	285 000	285 000	35 000
Mackenzie	160 000	285 000	285 000	285 000	35 000
Dawson Creek	160 000	285 000	285 000	285 000	35 000
Fort St. John	160 000	285 000	285 000	285 000	35 000
Fort Nelson	160 000	285 000	285 000	285 000	35 000
Total Investments	1 280 000	2 280 000	2 280 000	2 280 000	280 000

Wildlife and Wildlife Habitat Inventories

The census is incomplete for population and habitat information of wildlife species not currently considered at risk (moose, elk deer, pine marten wolverine and mountain goat). Inadequate or unreliable knowledge prevents the definition of clear and measurable objectives, thereby frustrating effective management planning. Without a means of projecting the future supply of these wildlife species, a management strategy in most forest management units is impossible.

In an approach similar to Section 9.2.5, a two three component strategy is recommended to resolve this resource information problem. Firstly, known information is assembled, organized and extended to users. Secondly, a inventory gap program is implemented to provide missing, key information elements. The third strategy is not an inventory activity, and consists of population and habita projection model development. Table 9.2.8 a) provides an estimate of the costs to implement the first two strategies.

Table 9.2.8 b) provides an estimate of the costs to implement a similar strategy directed exclusively at the Northern Caribou, a critically important species in the region.

Sustainable Forest Management places great emphasis on the preservation of biodiversity, particularly the conservation of species of plants, animals considered "at risk" from forest development. In the Prince George Forest Region the following species are generally considered within this category:

- Grizzly bear
- Wolverine
- Fisher

- Arctic Grayling
- Bull Trout
- White Sturgeon
- Various raptors and songbirds

Population and habitat status and dynamics for each of these species has not been completely evaluated, preventing clearly defined and measurable objectives for their preservation and enhancement. Until this knowledge is acquired, SFM principles demand the most cautious and conservative management strategies, which often severely constrain the supply of other forest resources in "at risk" species management zones.

A similar two-component inventory investment should be focused on consolidating, organising and extending all known information for plant and animal species known or assumed to be currently "at risk" within each management unit. An output of this project is a strategic plan for the collection of key, missing information. Table 9.2.8 c) provides an estimate of the costs of such strategy.

Table 9.2.8 a) **Wildlife Inventory Strategic Investments Required in the Prince George Forest Region.**

Forest District	20001/02 ($)	2002/03 ($)	2003/04 ($)	2004/05 ($)	2005/06 ($)
Prince George	70 000	110 000	110 000	100 000	100 000
Robson Valley	70 000	110 000	110 000	100 000	100 000
Vanderhoof	70 000	110 000	110 000	100 000	100 000
Fort St. James	70 000	110 000	110 000	100 000	100 000
Mackenzie	70 000	110 000	110 000	100 000	100 000
Dawson Creek	70 000	110 000	110 000	100 000	100 000
Fort St. John	70 000	110 000	110 000	100 000	100 000
Fort Nelson	70 000	110 000	110 000	100 000	100 000
Total Investments	560 000	880 000	880 000	800 000	800 000

Table 9.2.8 b) **Caribou Inventory Strategic Investments Required in the Prince George Forest Region.**

Forest District	20001/02 ($)	2002/03 ($)	2003/04 ($)	2004/05 ($)	2005/06 ($)
Prince George	150 000	100 000	100 000	0	0
Robson Valley	0	0	0	0	0
Vanderhoof	150 000	100 000	100 000	0	0
Fort St. James	200 000	100 000	100 000	0	0
Mackenzie	150 000	100 000	100 000	0	0
Dawson Creek	150 000	100 000	100 000	0	0
Fort St. John	0	0	0	0	0
Fort Nelson	0	0	0	0	0
Total	800 000	500 000	100 000	0	0

Investments					

Table 9.2.8 b) **Species-at-risk Inventory Strategic Investments Required in the Prince George Forest Region.**

Forest District	20001/02 ($)	2002/03 ($)	2003/04 ($)	2004/05 ($)	2005/06 ($)
Prince George	220 000	400 000	400 000	400 000	400 000
Robson Valley	220 000	400 000	400 000	400 000	400 000
Vanderhoof	220 000	400 000	400 000	400 000	400 000
Fort St. James	220 000	400 000	400 000	400 000	400 000
Mackenzie	220 000	400 000	400 000	400 000	400 000
Dawson Creek	220 000	400 000	400 000	400 000	400 000
Fort St. John	220 000	400 000	400 000	400 000	400 000
Fort Nelson	220 000	400 000	400 000	400 000	400 000
Total Investments	1 760 000	3 200 000	3 200 000	3 200 000	3 200 000

12.10 FOREST RECREATION SITE AND TRAIL MAINTENANCE APPENDICES

Table A-12.10.1 Schedule of Ministry of Forest Recreation Fees

Type of Fee	Where Fees Apply	Fee Rate	Sold By	What Money is Used For
Camping Pass	All campgrounds	$27 (annual) $22 (seniors rate) $8 (per night)	Government agents, sub-issuers, FS offices	money used to keep campgrounds open
Enhanced Campground Fee	high-use campgrounds	$10 (per night) Annual pass holder discount of 50% ($5 per night)	Contractor	money retained by contractor to pay for enhanced services
Enhanced Trail Fees (for enhanced services e.g. track-setting, cabins)	about 30 trails	locally determined	club (non-profit group)	money retained by club to pay for enhanced services
Other Fees:				
Brochures	all districts	between $2 to $4 (to be determined	government agents & sub-issuers	money to pay for printing and distribution of brochures
Firewood	some campgrounds	price range from $2.00 to $5.00 per bundle (locally determined)	b) contractor or club	money to contractor/club to pay for provision of firewood

Table A-12.10.1 Backlog Replacement Structures at Forest Service Recreation Sites.

Structure		Value ($)	Dawson Cr.	$	Ft. Nelson	$	Ft. St. James	$	Ft. St. John	$	Mackenzie	$	Pr. George	$	Robson Valley	$	Vanderhoof	$	Total Cost	Total Structures
Fire Rings:	Metal	100	8	800	0	0	51	5,100	3	300	0	0	0	0	0	0	36	3,600	$9,800	98
	Rim	25	0	0	0	0	0	0	0	0	24	600	149	3,725	0	0	0	0	$4,325	173
	Rock	25	0	0	0	0	0	0	0	0	7	175	0	0	0	0	0	0	$175	7
Registration box		100	0	0	0	0	0	0	0	0	19	1,900	0	0	0	0	0	0	$1,900	19
Entrance sign		300	0	0	0	0	2	600	0	0	0	0	31	9,300	0	0	0	0	$9,900	33
Tables:	Lumber	250	0	0	0	0	0	0	1	250	40	10,000	0	0	0	0	0	0	$10,250	41
	Log	500	6	3,000	0	0	20	10,000	0	0	0	0	58	29,000	6	3,000	52	26,000	$71,000	142
	Concrete	600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	0
Wheel Chair Accessible		600	0	0	0	0	0	0	0	0	0	0	1	600	0	0	0	0	$600	1
Tent pad		500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	0
Toilet		1000	1	1,000	0	0	1	1,000	0	0	3	3,000	17	17,000	3	3,000	4	4,000	$29,000	29
Boardwalk per m		30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	0
Boat Launch:	Car top unimproved	1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	0
	Gravel	5000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	0
	Concrete	20000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	20,000	$20,000	1
Firewood corral		500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1,000	$1,000	2
Gates		5000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	0
Barriers per m		30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	0
Litter Barrels:	45 gallon drum	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	0
	Bear proof single door	500	0	0	0	0	0	0	0	0	0	0	2	1,000	0	0	0	0	$1,000	2
	Bear proof double door	1000	0	0	0	0	0	0	0	0	0	0	1	1,000	0	0	0	0	$1,000	1
	Shelter	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1,200	$1,200	3
Trails per m		10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	0
Numbered campsite post		100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	0

Signs	Regulatory/ Directional	125	0	0	0	0	0	0	0	0	14	1,750	21	2,625	0	0	2	250	$4,625	37
Signs/Information shelter		300	0	0	0	0	0	0	0	0	0	0	1	300	3	900	1	300	$1,500	5
Stairs per m		50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	0
Wharf per m		200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	0
Engineered foot bridge per m		1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	0
Shelter		5000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	0
Canoe rest		80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	0
	TOTALS			**$4,800**		**$0**		**$16,700**		**$550**		**$17,425**		**$64,550**		**$6,900**		**$56,350**	**$167,275**	

12.11. research

CURRENTLY UNDER REVISION – EXPECTED COMPLETION OCTOBER 24

regional research issues and concerns

Forest Renewal BC Research Program

PRINCE GEORGE REGIONAL KNOWLEDGE GAP SUMMARY

PROVINCIAL RESEARCH INVESTMENT THEMES

SSFM Researchable Issues

SH Research Studies

listing of Potential regional research Investments

PLANTING WHITE SPRUCE UNDER MATURE ASPEN

Justification

Study Cost 2001/02

$10 000

Total Cost

$70 000 over 5 years.

This project will run for a minimum of 20 years, with intensive remeasurement in years 2, 7, 12, and 17. Total cost approx. $250,000.

Funding required for next 3 years

$35 000

Partners Involved

Craig DeLong, Richard Kabzems (MoF – PG Region), Chris Hawkins (UNBC).

Description

This is an existing trial that examines planting of white spruce under mid-aged (40-70 yr old) aspen stands and compares them to white spruce planted in clearcuts. It is unique in British Columbia and is the longest standing active research trial on planting spruce under mature aspen in the boreal forest. Some previous installations installed in Alberta and Manitoba have not been kept up and also used outdated nursery techniques for the growing stock. The results from this trial will provide useful information for planning and conducting operational trials and innovative practices in the mixedwood forests across the boreal and sub-boreal forest regions of Canada. Much attention is being placed on developing innovative management regimes for the mixedwood forests in British Columbia due to the desire to regenerate stands similar to what were found naturally and due to the high costs associated with establishing white spruce plantations in these forest types. This project will provide information on a viable and low cost alternate to establish mixedwood stands that would follow a common natural successional pathway.

Deliverables

At the end of 3 years the 10 year results will be produced in a extension publication aimed at general forestry/silviculture audience. Data from trial will be incorporated into growth and yield models for mixed stands. Field tour will be conducted.

DISTRIBUTION AND MECHANICS OF CATASTROPHIC, LONG RUN-OUT ROCK AVALANCHES IN THE NORTHERN ROCKY MOUNTAINS

Justification

Study Cost 2001/02

$50 000

Total Cost

$50 000 over 1 year.

Partners Involved

Marten Geertsema (MoF - PG Region); John Clague (Simon Fraser University and Geological Survey of Canada); Oldrich Hungr (University of British Columbia); and Ministry of Forests (Fort Nelson Forest District).

Description

Large (tens of millions of cubic meters) rock avalanches with long run out zones occur in the Foothills of the Northern Rocky Mountains (e.g. Steamboat area, west of Fort Nelson). These landslides cause a tremendous amount of forest site loss, and pose hazards for roads and recreation trails. Forest activities could aggravate slide incidence. Little is known about the pre-conditions of these catastrophic landslides, or the prediction of run out distances.

Radar imagery, air photos, and ground observations will be used to predict magnitude / frequency relationships of these catastrophic rock avalanches and to map their distribution.

Deliverables

- Establishment report and progress reports.
- Terrain hazard maps.
- Extension publication aimed at general forestry audience.
- Preparation and submission of journal article; conference presentation(s).

DISTRIBUTION AND MECHANICS OF CATASTROPHIC, TRANSLATIONAL LANDSLIDES IN THE FORT NELSON AREA

Justification

Study Cost 2001/02

$50 000

Total Cost

$50 000 over 1 year.

Partners Involved

Marten Geertsema (MoF - PG Region); John Clague (Simon Fraser University and Geological Survey of Canada); Doug Steed (Simon Fraser University); and Ministry of Forests (Fort Nelson Forest District).

Description

Large (hundreds of millions of cubic meters) translational bedrock and soil slides occur in areas of soft, flat-lying sedimentary bedrock in the Fort Nelson area. Such slides cause a tremendous amount of forest site loss directly, and indirectly by impounding rivers and drowning upstream forests. Little is known about the recurrence intervals of these landslides. Many of these landslides occur in forested areas, including areas with large wildfires. If the recurrence intervals of these failures is greater than 100 years, there is little use in investing silviculture dollars on sites affected by these landslides.

Air photo analysis, ground observations, dendrochronology and radiocarbon dating will be used to predict magnitude / frequency relationships of these catastrophic slides and to map their distribution.

Deliverables

- Establishment report and progress reports.
- Terrain hazard maps.
- Extension publication aimed at general forestry audience.
- Preparation and submission of journal article; conference presentation(s).

FIRE AND LANDSLIDE RECURRENCE INTERVALS IN THE BOREAL FORESTS OF NORTHEASTERN BRITISH COLUMBIA

Justification

Study Cost 2001/02

$50 000

Funding required for next 3 years

$150 000

Total Cost

$50 000 over 3 years.

Partners Involved

Marten Geertsema (MoF - PG Region); Tim Jull (Arizona State University; Richard Hebda (Royal BC Museum, and Ministry of Forests (Fort St. John Forest District).

Description

Little is known about natural disturbance frequencies in the boreal forest. Well-preserved charcoal layers exist on fans and in landslide colluvium (e.g. one site along the Peace River has more than 30 charcoal layers in one profile). Such records would provide forest managers with valuable information about frequent past disturbances, allowing them to mimic forest harvesting with natural disturbances.

Tree ring observations and radiocarbon dating will be used to determine natural disturbance frequencies.

Deliverables

- Establishment report and progress reports.
- Extension publication aimed at general forestry audience.
- Preparation and submission of journal article; conference presentation(s).

HAZARDS POSED BY SUBAQUEOUS SLIDES IN LAKES IN MOUNTAINOUS AREAS

Justification

Study Cost 2001/02

$50 000

Funding required for next 3 years

$150 000

Total Cost

$150 000 over 3 years.

Partners Involved

Marten Geertsema (MoF - PG Region); John Clague (Simon Fraser University and Geological Survey of Canada); Oldrich Hungr (University of British Columbia); Ministry of Environment; and Ministry of Forests (Fort Nelson, Fort St. John, and Mackenzie Forest Districts).

Description

Recently a large underwater slide (a fan-delta collapse) in a deep lake in a mountainous area near Houston, B.C., generated a large series of destructive waves. These waves (several meters high) caused extensive damage to docks on the opposite end of the lake, and resulted in site loss on the fan. Such events pose problems for forest recreationalists in two ways. 1. Fans are gravely and tend to make favourable good camp sites. Shorelines on some of these fans are prone to sudden collapse. 2. Waves generated by collapse of these fans are extremely destructive and can oscillate on such a lake for hours.

Air photo analysis, and ground observations will be used to determine which lakes are subject to these catastrophic subaqueous slides.

Deliverables

- Establishment report and progress reports.
- Hazard maps.
- Extension publication aimed at general forestry audience.
- Preparation and submission of journal article; conference presentation(s).

FIRE-RELATED SLOPE INSTABILITY AND SEDIMENTATION: HISTORICAL FREQUENCIES ON THE WESTERN SLOPES OF THE ROCKY MOUNTAINS

Justification

Study Cost 2001/02

$50 000

Total Cost

$150 000 over 3 years.

Funding required for next 3 years

$150 000

Partners Involved

Paul Sanborn & Marten Geertsema (MoF – PG Region), Tim Jull (University of Arizona)

Description

A pilot study in the ICHwk3 (Robson Valley Forest District) suggest that fire-triggered episodes of instability and sedimentation comprise the major pulses of activity in forested watersheds on the moist to wet windward slopes of the Rocky Mountains. In particular, many of these watersheds are deeply mantled by glaciolacustrine materials, which present special challenges for soil and sediment management during forestry operations. These materials also provide conditions for both generating and preserving a record of fire-related sedimentation events, which can be radiocarbon dated, allowing the historical frequency of severe, watershed-modifying events to be reconstructed. Such chronologies would complement current methods for reconstructing natural disturbance regimes, and allow the scale of modern forest management impacts (*e.g.* prescribed fire, soil disturbance, sedimentation) to be placed in a more realistic long-term perspective.

Radiocarbon dating of charcoal and related materials will be used to estimate the frequency of fire-triggered slope instability and sedimentation in a latitudinal transect of major valleys sharing these ecological and geomorphic characteristics: moist to wet climates, infrequent but severe fires, and very erodible/unstable glaciolacustrine sediments. Field studies would focus on one major watershed east of the Rocky Mountain Trench in each of Robson Valley, Prince George, and Mackenzie Forest Districts.

Deliverables

Progress reports, journal articles, and extension bulletins/Web site pages aimed at operational forestry audiences, and conference presentations.

BOREAL MIXEDWOOD DECISION SUPPORT SYSTEM

Justification

Study Cost 2001/02

$45,000

Total Cost

$ 45,000 over 1 year

Partners Involved

Richard Kabzems (MoF – PG Region), Craig DeLong (MoF – PG Region), Chris Hawkins (UNBC), Karel Klinka (UBC) and Pal Varga (UBC)

Description

Silvicultural options for boreal mixedwoods are quite varied. The complexity and changing structure of mixedwood stands over time can create difficulties in linking the current state of the forest stand to desired outcomes. There is a large body of relevant research and operational experience that can be used to assist in forest management decisions at the stand level, to achieve stand and forest level objectives. A visual presentation combined with extension of available research would be highly effective in presenting ecological and silvicultural concepts to forest managers, First Nations, and other stakeholders.

The support system, which would be CD-ROM and/or web based would be organized according to ecological units and make extensive use of photographic examples of both initial pre-harvest conditions and successional stages under both managed and natural conditions. This project would incorporate the experience of Karel Klinka and Pal Varga of UBC in creating a very successful CD-ROM system (SELECT) for coastal B.C. forests. Once the support system has been created, the electronic design would allow rapid updates with current information. In co-operation with the Northern Forest Research and Extension partnership this format would facilitate creation of different extension products, which could be uniquely designed for specific audiences.

Deliverables

Decision Support System in CD-ROM and electronic formats aimed at general forestry audiences.

Electronic platform for creation of extension targets to specific audiences (First Nations, schools, forest resource stakeholders).

STRUCTURE AND DEVELOPMENT OF MATURE ASPEN – SPRUCE MIXEDWOODS

Justification

Study Cost 2001/02

$55,000

Total Cost

$ 330 000 over 5 years

Funding required for next 3 years

2001-02 $55,000 2002-03 $125,000 2003-04 $100,000

Partners Involved

Richard Kabzems (MoF – PG Region), and Dr. Oscar Garcia (UNBC)

Description

Complex mature stands of aspen and white spruce are a common feature of the boreal forests in northeastern B.C. Current volume and yield projections from existing models do not adequately represent complex stand dynamics. Information is required to calibrate models and improve our management practices for mixed stands. The growth patterns of trees are best understood if studied over a long period of time. However, in a short period of time, patterns of growth and development can be analyzed from stem sections taken by destructive sampling.

The study approach would be to identify candidate stands in the Dawson Creek and Fort St. John Forest Districts, stem map plots within stands, and subsequently destructively sample trees within the plots. The study results will calibrate growth and yield projections for this type of mixed species stand. In addition to improved modeling of growth and yield, the study will contribute data sets for: 1) improved silviculture strategies for mixedwoods, 2) improved estimates of site index for mixed species stands, and 3) quantification of decay levels in both aspen and white spruce in these stand types.

Deliverables

Extension publication after initial analysis of year 3 data.

Graduate student thesis.

Preparation and submission of journal article; conference presentation(s).

Reference data sets for calibration of Growth and Yield models for complex stands.

REHABILITATION OF ROADSIDE PROCESSING AREAS IN BOREAL MIXEDWOODS

Justification

Study Cost 2001/02

$75 000

Total Cost

$220 000 over 5 years

Funding required for next 3 years

2001-02 $75,000 2002-03 $70,000 2003-04 $30,000

Partners Involved

Richard Kabzems (MoF – PG Region) and Chuck Bulmer (MoF-Research Branch)

Description

Poor stocking and productivity of both broadleaf and coniferous trees is commonly observed on roadside processing areas that have a summer harvesting history in the BWBS. There needs to be an examination of potential rehabilitation techniques to ameliorate limiting soil conditions, successfully establish, and increase stocking of both broadleaf and coniferous crop trees. The existing Long Term Productivity Study in the Dawson Creek Forest District provides an established benchmark for comparing changes in soil properties and growth responses of aspen and white spruce.

Candidate sites for rehabilitation treatments would be located in the Dawson Creek, Fort St. John and Fort Nelson Forest Districts. Soil conditions pre and post treatment would be quantified and monitored. Several operationally feasible treatments would be tested (eg. Mounding and mixing attachments on excavators), and planted with container stock of commercial broadleaf and conifer species. Permanent sample plots would be established and monitored to track changes in soil properties and seedling growth performance.

Deliverables

At the completion of initial analyses; establishment report and summary progress report.

Extension publication aimed at general forestry/silviculture audience.

Preparation and submission of journal article; conference presentation(s).

PREDICTING REGENERATION AND GROWTH RESPONSES FOR ASPEN AND WHITE SPRUCE AFTER APPLICATION OF ALTERNATIVE SILVICULTURE SYSTEMS IN BOREAL MIXEDWOODS

Justification

Study Cost 2001/02

$65 000

Total Cost

$130 000 over 5 years

Funding required for next 3 years

2001-02 $65,000 2002-03 $30 000 2003-04 $35 000

Partners Involved

Richard Kabzems (MoF – PG Region), Dr. Chris Hawkins (UNBC) and Dr. Oscar Garcia (UNBC)

Description

In the Fort Nelson Forest District a number of alternative silviculture systems have been applied in boreal mixedwood stands. Where white spruce advance regeneration has been retained, analysis is required to quantify growth response and mortality of the white spruce component. Windthrow is the major cause of initial mortality for retained white spruce. Data from established wind towers will be monitored and analyzed to improve prediction of catastrophic wind events. Regeneration, growth and mortality of the broadleaf component are all hypothesized to be a function of the number, size and distribution of the retained white spruce. This relationship can be tested with analysis and modeling of the light environments created post-harvest.

Establishment of permanent sample plots will create a long-term data source for improvement of growth and yield predictions of future stand composition, yield and structure.

Deliverables

Extension publication aimed at general forestry/silviculture audience.

Graduate student thesis

Preparation and submission of journal article, conference presentations.

STRATEGIES FOR CREATING AND TENDING MIXTURES OF CONIFERS AND BROADLEAF SPECIES

Justification

Study Cost 2001/02

$65 000

Total Cost

$130 000 over 5 years

Funding re uired for next 3 years

2001-02 $65,000 2002-03 $30 000 2003-04 $35 000

Partners Involved

Richard Kabzems (MoF – PG Region), Dr. Chris Hawkins (UNBC), and Lorne Bedford (MoF-Victoria)

Description

The tending of young mixedwood stands is a key knowledge requirement for the BWBS. A diversity of existing research installations, especially in northeastern B.C. has created mixtures of conifer and broadleaf species through various combinations of interplanting, underplanting, and natural regeneration. Several of these sites are now approaching the 10 to 15 year mark, and will provide important opportunities to observe the dynamics of conifers and broadleaf species in deliberately-created mixtures. New installations will be required to address the implications of spatial distribution (i.e. clumps of species). Silvicultural feasibility of establishing these clumpy distributions and the growth and yield implications of such stands must be examined.

Deliverables

At the completion of initial analyses for 'clumpy' distribution experiment; establishment report and summary progress report.

Extension publication on 'clumpy' distribution for mixedwoods, aimed at general forestry/silviculture audience

Extension publication focused on implications for future stand development when assessing boreal mixed species stands at the 'Free-Growing' window